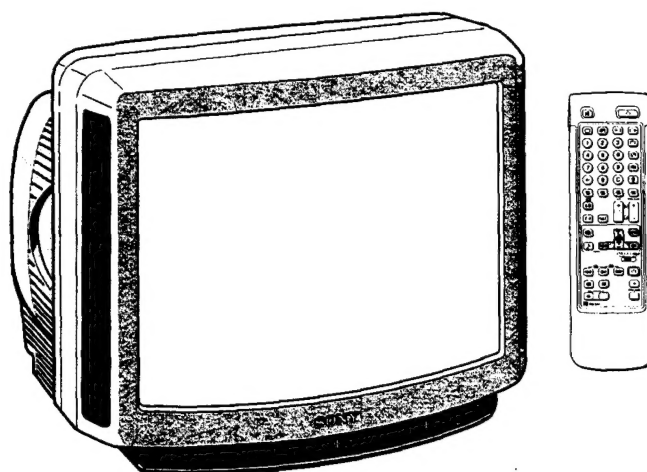


SERVICE MANUAL

AE-2B CHASSIS

MODEL	COMMANDER	DEST.	CHASSIS NO.	MODEL	COMMANDER	DEST.	CHASSIS NO.
KV-X2171A	RM-831	Italian	SCC-G59B-A	KV-X2173E	RM-831	Spanish	SCC-G56B-A
KV-X2171B	RM-831	French	SCC-G57B-A	KV-X2172U	RM-831	UK	SCC-G55B-A
KV-X2171D	RM-831	AEP	SCC-G45B-A				



TRINITRON® COLOR TV
SONY®

ITEM	MODEL	Television System	Stereo System	Channel Coverage	Color System
Italian		B/G/H, D/K	GERMAN Stereo	ITALIA VHF:A-H2 (C) UHF: 21-69 PAL B/G/H VHF:E2-E12 UHF:E21-E69 CABLE TV (1):S1-S41 CABLE TV (2):S01-S05, M1-M10, U1-U10 D/K VHF:R01-R12 UHF:R21-R69	PAL, SECAM NTSC4.43, NTSC3.58 (VIDEO IN)
French		B/G/H, D/K L, I	GERMAN Stereo	L VHF:F02-F10 UHF:F21-F60 CABLE:B-Q B/G/H VHF:E2-E12 UHF:E21-E69 CABLE TV (1):S1-S41 CABLE TV (2):S01-S05, M1-M10, U1-U10 ITALIA VHF:A-H2 (C) UHF:21-69 I UHF:B21-B69	PAL, SECAM NTSC4.43, NTSC3.58 (VIDEO IN)
AEP		B/G/H, D/K	GERMAN Stereo	PAL B/G/H VHF:E2-E12 UHF:E21-E69 CABLE TV (1):S1-S41 CABLE TV (2):S01-S05, M1-M10, U1-U10 ITALIA VHF:A-H2 (C) UHF:21-69 D/K VHF:R01-R12 UHF:R21-R69	PAL, SECAM NTSC4.43, NTSC3.58 (VIDEO IN)
Spanish		B/G/H, D/K	GERMAN/NICAM Stereo	PAL B/G VHF:E2-E12 UHF:E21-E69 CABLE TV (1):S1-S41 CABLE TV (2):S01-S05, M1-M10, U1-U10 ITALIA VHF:A-H2 (C) UHF:21-69 D/K VHF:R01-R12 UHF:R21-R69	PAL, SECAM NTSC4.43, NTSC3.58 (VIDEO IN)
UK		I	NICAM Stereo	UHF : B21-B69	PAL, SECAM NTSC4.43, NTSC3.58 (VIDEO IN)

MODEL	Italian	French	AEP	Spanish	UK
Power Consumption	87W	98W	97Wh	99Wh	122W

SPECIFICATIONS

Picture Tube Hi-Black Trinitron
Approx. 54.5 cm (21 inches)
(Approx. 51 cm picture measured diagonally)
100° -deflection

Input/Output Terminals

[REAR]

- Ⓔ-1 21-pin Euro connector (CENELEC standard)
 - inputs for audio and video signals
 - inputs for RGB
 - outputs of TV video and audio signals
- Ⓔ-2/Ⓔ-3 2 21-pin Euro connector
 - inputs for audio and video signals
 - inputs for S video
 - outputs for audio and video signals (selectable)
- Ⓔ-4 Audio outputs (variable) - phono jacks

[FRONT]

- Ⓔ-5 Video input - phono jack
- Ⓔ-6 Audio inputs - phono jacks
- Ⓔ-7 S video input 4-pin DIN
- Ⓔ-8 Headphone jacks : stereo minijack

- Sound output 2 x 12W (RMS)
2 x 30W (Music)
- Power requirements 220 - 240V
- Dimensions Approx. 517x443x485 mm
- Weight Approx. 28kg
- Supplied accessories RM-831 Remote Commander (1)
IEC designation R6 battery (1)
- Other features NICAM, FASTEXT.


[RM-831]

- Remote control system infrared control
- Power requirements 1.5V dc
1 battery IEC designation R6 (size AA)
- Dimensions Approx. 65x225x21 mm (w/h/d)
- Weight Approx. 157g (Not including batteries)

Design and specifications are subject to change without notice.

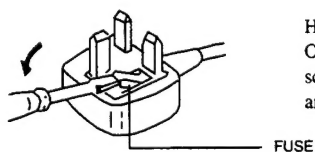
Model name	KV-X2171A	KV-X2171B	KV-X2171D	KV-X2173E	KV-X2172U
Item					
Pal Comb	OFF	OFF	OFF	OFF	OFF
PIP	OFF	OFF	OFF	OFF	OFF
RGB Priority	ON	ON	OFF	OFF	OFF
Woofer Box	OFF	OFF	OFF	OFF	OFF
Scart 1	ON	ON	ON	ON	ON
Scart 2	ON	ON	ON	ON	ON
Front in (3)	ON	ON	ON	ON	ON
Scart 4	OFF	OFF	OFF	OFF	OFF
Dyn. Convergence	OFF	OFF	OFF	OFF	OFF
Projector	OFF	OFF	OFF	OFF	OFF
AKB in 16:9 mode	ON	ON	ON	ON	ON
Norm B/G	ON	ON	ON	ON	OFF
Norm I	OFF	ON	OFF	OFF	ON
Norm D/K	ON	ON	ON	ON	OFF
Norm AUS	OFF	OFF	OFF	OFF	OFF
Norm L	OFF	ON	OFF	OFF	OFF
Norm SAT	OFF	OFF	OFF	OFF	OFF
Norm M	OFF	OFF	OFF	OFF	OFF
Language Preset	Italiano	Francais	Deutsch	None	English

WARNING (KV-X2172U only)

The flexible mains lead is supplied connected to a **B.S. 1363** fused plug having a fuse of **5 AMP** capacity. Should the fuse need to be replaced, use a **5 AMP FUSE** approved by **ASTA** to **BS 1362**, ie one that carries the  mark.

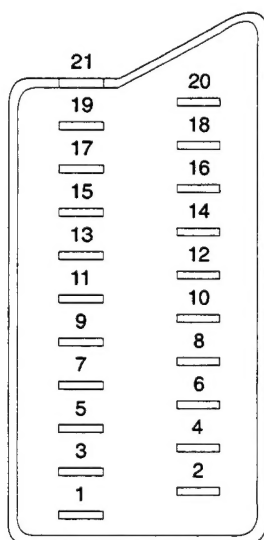
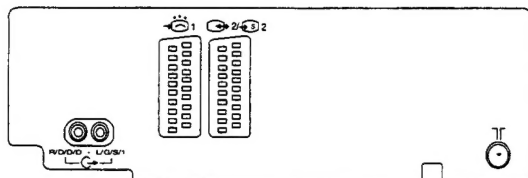
IF THE PLUG SUPPLIED WITH THIS APPLIANCE IS NOT SUITABLE FOR YOUR SOCKET OUTLETS IN YOUR HOME. IT SHOULD BE CUT OFF AND AN APPROPRIATE PLUG FITTED. THE PLUG SEVERED FROM THE MAINS LEAD MUST BE DESTROYED AS A PLUG WITH BARED WIRES IS DANGEROUS IF ENGAGED IN A LIVE SOCKET OUTLET.

When an alternative type of plug is used it should be fitted with a **5 AMP FUSE**, otherwise the circuit should be protected by a **5 AMP FUSE** at the distribution board.



How to replace the fuse.
Open the fuse compartment with the screwdriver blade and replace the fuse.

21 pin connector (1 2 4)



Pin No.	1	2	4	Signal	Signal level
1	○	○	○	Audio output B (right)	Standard level : 0.5V rms Output impedance : Less than 1kohm*
2	○	○	○	Audio input B (right)	Standard level : 0.5V rms Output impedance : More than 10kohm*
3	○	○	○	Audio output A (left)	Standard level : 0.5V rms Output impedance : Less than 1kohm*
4	○	○	○	Ground (audio)	
5	○	○	○	Ground (blue)	
6	○	○	○	Audio input A (left)	Standard level : 0.5V rms Output impedance : More than 10kohm*
7	○	●	●	Blue input	0.7 ± 3dB, 75 ohms, positive
8	○	○	○	Function select (AV control)	High state (9.5 - 12V) : Part mode Low state (0 - 2V) : TV mode Input impedance : More than 10k ohms Input capacitance : Less than 2nF
9	○	○	○	Ground (green)	
10	○	○	○	Open	
11	○	●	●	Green	Green signal : 0.7 ± 3dB, 75 ohms, positive
12	○	○	○	Open	
13	○	○	○	Ground (red)	
14	○	○	○	Ground (blanking)	
15	○	—	—	Red input	0.7 ± 3dB, 75 ohms, positive
16	○	●	●	Blanking input (Ys signal)	High state (1 - 3V) Low state (0 - 0.4V) Input impedance : 75ohms
17	○	○	○	Ground (video output)	
18	○	○	○	Ground (video input)	
19	○	○	○	Video output	1V ± 3dB, 75ohms, positive sync: 0.3V(-3+10dB)
20	○	—	—	Video input	1V ± 3dB, 75ohms, positive sync: 0.3V(-3+10dB)
21	○	○	○	Common ground (plug, shield)	

○ Connected ● Not Connected (open) * at 20Hz - 20kHz

Pin No	Signal	Signal level
1	Ground	
2	Ground	
3	Y (S signal) input	1V ± 3dB 75 ohm , positive Sync. 0.3V -3/+10 dB
4	C (S signal) input	0.3V ± 3dB 75 ohm , positive Sync.

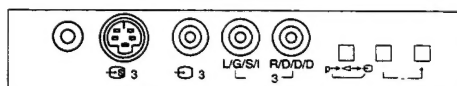


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CAUTION

SHORT CIRCUIT THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR CARBON PAINTED ON THE CRT, AFTER REMOVAL OF THE ANODE CAP.

WARNING !!

AN ISOLATING TRANSFORMER SHOULD BE USED DURING ANY SERVICE WORK TO AVOID POSSIBLE SHOCK HAZARD, DUE TO A LIVE CHASSIS. THE CHASSIS OF THIS RECEIVER IS DIRECTLY CONNECTED TO THE AC POWER LINE.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND MARKED  ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL FOR SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.


ATTENTION

APRES AVOIR DECONNECTE LE CAP DE L'ANODE, COURT-CIRCUITER L'ANODE DU TUBE CATHODIQUE ET CELUI DE L'ANODE DU CAP AU CHASSIS METALLIQUE DE L'APPAREIL, OU AU COUCHE DE CARBONE PEINTE SUR LE TUBE CATHODIQUE OU AU BLINDAGE DU TUBE CATHODIQUE.

ATTENTION !!

AFIN D'EVITER TOUT RISQUE D'ELECTROCUTION PROVENANT D'UN CHÂSSIS SOUS TENSION, UN TRANSFORMATEUR D'ISOLEMENT DOIT ETRE UTILISÉ LORS DE TOUT DÉPANNAGE. LE CHÂSSIS DE CE RÉCEPTEUR EST DIRECTEMENT RACCORDÉ À L'ALIMENTATION SECTEUR.

ATTENTION AUX COMPOSANTS RELATIFS À LA SÉCURITÉ !!

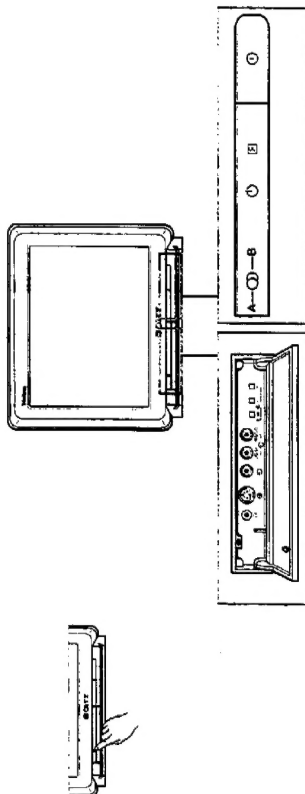
LES COMPOSANTS IDENTIFIÉS PAR UNE TRAME ET PAR UNE MARQUE  SUR LES SCHÉMAS DE PRINCIPE, LES VUES EXPLOSÉES ET LES LISTES DE PIÉCES SONT D'UNE IMPORTANCE CRITIQUE POUR LA SÉCURITÉ DU FONCTIONNEMENT, NE LES REMPLACER QUE PAR DES COMPOSANTS SONY DONT LE NUMÉRO DE PIÉCE EST INDIQUÉ DANS LE PRÉSENT MANUEL OU DANS DES SUPPLÉMENTS PUBLIÉS PAR SONY.

SECTION 1 GENERAL

Overview

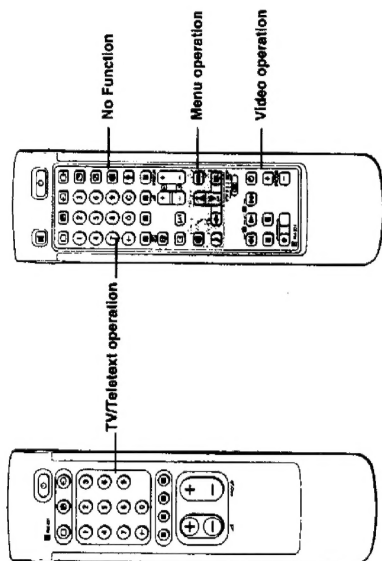
This section briefly describes the buttons and controls on the TV set and on the Remote Commander. For more information, refer to the pages given next to each description.

TV set - front



Symbol	Name	Refer to page
ⓘ	Main power switch	13
ⓘ	Standby indicator	13
A-CD-B	Stereo A/B indicators	15
ⓘ	Headphones jack	20
ⓘ	Input jacks (S-video/video/audio)	20
ⓘ	Function selector (Programme/volume/input)	13
ⓘ	Adjustment buttons for function selector	13

Remote Commander RM-831



Note
The SAT button does not operate with this TV.

Simple side

Symbol	Name	Refer to Page
ⓘ	Mute on/off button	14
ⓘ	Standby button	13
ⓘ	TV power on/TV mode selector button	13
ⓘ	Teletext button	14
ⓘ	Input mode selector	14
ⓘ	Output mode selector	21
ⓘ	Number buttons 1,2,3,4,5,6,7,8,9, and 0	13
ⓘ	Double-digit entering button	13
ⓘ	Direct channel entering button	10
ⓘ	Volume control button	13
ⓘ	PROGR +/- Programme selectors	13
ⓘ	Teletext page access buttons	17
ⓘ	Picture adjustment button	15
ⓘ	Sound adjustment button	15
ⓘ	On-screen display button	14
ⓘ	Teletext hold button	17
ⓘ	Time display button	14
ⓘ	Fasttext buttons	17

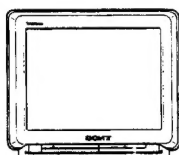
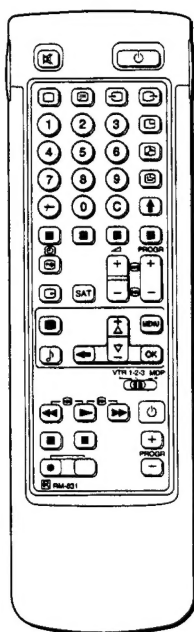
Menu operation

Symbol	Name	Refer to Page
ⓘ	MENU	7
ⓘ	Menu on / off button	7
ⓘ	Select buttons	7
ⓘ	OK (confirming) button	7
ⓘ	Back button	7

Video operation

Symbol	Name	Refer to Page
ⓘ	VTR1/2/3	22
ⓘ	Video equipment selector	22
ⓘ	Video equipment operation buttons	22

Step 3 Tuning in to TV Stations



①

To go back to main menu:
Keep pressing ◀.

To go back to the normal TV picture:
Press MENU. Normal TV picture will be restored after one minute if menu functions are not selected.

Note on the Demo function:
If you choose Demo on the main menu, you can see a sequential demonstration of the menu functions. Press MENU to stop the function.

Once you have set up the TV, you can choose the language of the menu. Then you should preset the channels (up to 60 channels) by choosing either the automatic or manual method.

The automatic method is easier if you want to preset all receivable channels at once. Use the manual method if you only have a few channels and want to preset channels one by one. The manual method is also convenient for allocating programme numbers to various video input sources.

Before you begin

- Check that the Full-Function side of the Remote Commander is visible.
- Locate Menu operation buttons on the Remote Commander. They are shaded in the illustration at the left.

1 Choose a language

- 1 Depress ① on the TV.

The TV will switch on. If the standby indicator on the TV is lit, press ① or a number button on the Remote Commander.

- 2 Press the MENU button.
The LANGUAGE menu appears. (See Fig. 1)
- 3 Select the language you want with ▲+ or ▼-, and then press OK.

MENU



Fig. 1.



2 Display the Menu

Press the ◀ button.
The main menu appears. (See Fig. 2)

Now, choose one of the methods described overleaf:

"Preset Channels Automatically"

or

"Preset Channels Manually".

It is recommended to choose

"Preset Channels Automatically".

Then the channels are automatically stored as follows;

Programme 1	—	BBC1
Programme 2	—	BBC2
Programme 3	—	ITV
Programme 4	—	CH4 or S4C

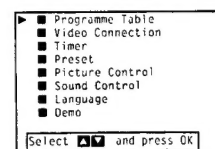


Fig. 2.

With this method, you can preset all receivable channels at once.

To stop automatic channel presetting:
Press \leftarrow on the Remote Commander.

Notes:

- After presetting the channels automatically, you can check which channels are stored on which programme positions. For details, see "Using the Programme Table" on page 16.

- You can sort the programme positions to have them appear on screen in the order you like. For details, see "Sorting Programme Positions" on page 10.

- Programme names are automatically taken from Teletext if available. If not please refer to page 11 "Captioning a station name" for further information.

3 Preset channels automatically

- 1 Select Preset with $\Delta+$ or $\nabla-$ and press OK. The PRESET menu appears. (See Fig. 3.)
- 2 Select Auto Programme with $\Delta+$ or $\nabla-$ and press OK. The AUTO PROGRAMME menu appears. (See Fig. 4.)
- 3 Press OK repeatedly until the first element of the "PROG" number is highlighted.
- 4 Select the programme (number button) from which you want to start presetting. Select the first element of the double-digit number with $\Delta+$ or $\nabla-$ or the number buttons (e.g. For "04", select "0" here) and press OK. The second element of "PROG" will be highlighted.
- 5 Select the second element of the double-digit number with $\Delta+$ or $\nabla-$ or the number buttons (e.g. For "04", select "4" here) (See Fig. 5.) and press OK.
- 6 The automatic channel presetting starts.
When presetting is finished, the preset menu reappears. All available channels are now stored on successive number buttons. (Press MENU to restore normal TV picture).

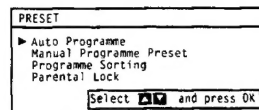


Fig. 3.

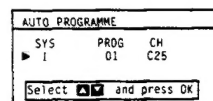


Fig. 4.



Fig. 5.

Use this method if there are only a few channels in your area to preset or if you want to preset channels one by one. You may also allocate programme numbers to various video input sources.

If you have made a mistake:
Press \leftarrow to go back to the previous position.
To go back to main menu
Keep pressing \leftarrow .
To go back to the normal TV picture
Press MENU.

3 Preset channels manually

- 1 Select Preset with $\Delta+$ or $\nabla-$ and press OK. The PRESET menu appears. (See Fig. 6.)
- 2 Select Manual Programme Preset with $\Delta+$ or $\nabla-$ and press OK. The MANUAL PROGRAMME PRESET menu appears. (See Fig. 7.)

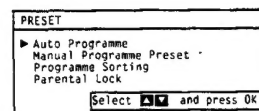


Fig. 6.

MANUAL PROGRAMME PRESET									
PROG	SYS	CH	SEARCH	LABEL	AFT				
1	1	C21	(off)	-----	(on)				
2	1	C34	(off)	-----	(on)				
3	1	C33	(off)	-----	(on)				
4	1	C45	(off)	-----	(on)				
5	1	C35	(off)	-----	(on)				
6	1	C44	(off)	-----	(on)				
7	1	C54	(off)	-----	(on)				
8	1	C30	(off)	-----	(on)				
9	1	C38	(off)	-----	(on)				
10	1	C59	(off)	-----	(on)				

Fig. 7.

To tune in a channel by frequency:

After selecting F in step 6, enter three digits using the number buttons. Press OK.

Please refer to "Television Channel Number Guide" on page 24.

- 3 Using Δ + or ∇ -, select the programme position (number button) to which you want to preset a channel, and press OK.
- 4 Keep pressing ∇ - to select programme numbers higher than 10.
- 5 Select, if necessary, a video input source (EXT) with Δ + or ∇ -. Then press OK. The first element of the CH position will be highlighted. (See Fig. 8.)
- 6 Using Δ + or ∇ -, select C (to preset a regular channel), or F (to tune in by frequency) and press OK. The first element of the "CH" number will be highlighted. If you have selected EXT in step 5, select the video input source with Δ + or ∇ -. (See Fig. 9.)

There are two ways to preset channels. If you know the channel number, go to step "7-Manual",

or

if you don't know the channel number, go to step "7- Search".

7 Manual

- a Select the first element of the "CH" number with Δ + / ∇ - or the number buttons and press OK. The second element of the "CH" number will be highlighted.
- b Select the second element of the number with Δ + / ∇ - or the number buttons. The selected number appears. (See Fig. 10.)
- c Press OK. The "SEARCH" position is highlighted and the selected channel is now stored. (See Fig. 11.)
- d Press OK until the cursor appears by the next programme position.
- e Repeat steps 3 to 7 to preset other channels.

7 Search

- a Press OK repeatedly until the colour of the SEARCH position changes.
- b Start searching for the channel with Δ + (up) or ∇ - (down). The CH position changes colour. (See Fig. 12.) The CH number starts counting up or downwards. When a channel is found, it stops. (See Fig. 13.)
- c Press OK if you want to store this channel. If not, press Δ + or ∇ - to continue channel searching.
- d Press OK until the cursor appears by the next programme position.
- e Repeat steps 3 to 7 to preset other channels.

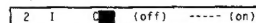


Fig.8.

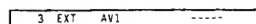


Fig.9.



Fig.10.

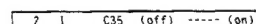


Fig.11.

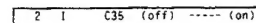


Fig.12.

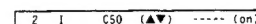
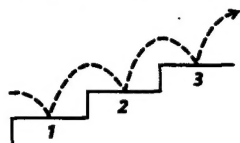


Fig.13.

If you have made a mistake:

Press \leftarrow to go back to the previous position.
To go back to main menu Keep pressing \leftarrow .
To go back to the normal TV picture Press MENU.

Additional Presetting Functions

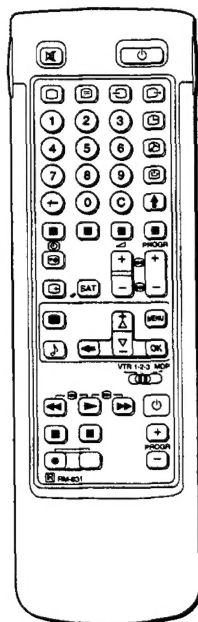


This section shows you additional presetting functions such as sorting or skipping programme positions, captioning a station name, manual fine-tuning, and using the parental lock.

Before you begin

- Check that the Full Function side of the Remote Commander is visible
- Locate the Menu operation buttons.

PROGRAMME SORTING



For higher programme positions:
The display scrolls automatically.

If you have made a mistake:
Press \leftarrow to go back to the previous position.
To go back to main menu:
Keep pressing \leftarrow .
To go back to the normal TV picture:
Press MENU.

Sorting Programme Positions

With this function, you can sort the programme positions to a preferable order.

- 1 Press MENU to display the main menu.
- 2 Select Preset with Δ + or ∇ - and press OK. The PRESET menu appears.
- 3 Select Programme Sorting with Δ + or ∇ - and press OK. The PROGRAMME SORTING menu appears. (See Fig. 14.)
- 4 Using Δ + or ∇ -, select the programme position you want to move to another programme position and press OK. The colour of the selected position changes. (See Fig. 15.)
- 5 Using Δ + or ∇ -, select the programme position to which you want to move the selected programme and press OK. Now the two programme positions have been sorted. (See Fig. 16.)
- 6 Repeat steps 4 and 5 to exchange other programme positions.

PROGRAMME SORTING					
PROG	CH	LABEL	PROG	CH	LABEL
0	AV1	VHS	8	C29	ITV
1	---	---	9	C35	C4
2	C52	BBC1	10	C02	---
3	C61	BBC2	11	C02	---
4	---	---	12	C02	---
5	VIDEO 8MM	---	13	C02	---
6	C02	---	14	C02	---
7	C02	---	15	C02	---

Fig. 14.

0	AV1	VHS	8	C29	ITV
---	-----	-----	---	-----	-----

Fig. 15.

PROGRAMME SORTING					
PROG	CH	LABEL	PROG	CH	LABEL
0	AV1	VHS	8	C02	---
1	---	---	9	C35	C4
2	C29	ITV	10	C02	---
3	C52	BBC1	11	C02	---
4	C61	BBC2	12	C02	---
5	---	---	13	C02	---
6	VIDEO 8MM	---	14	C02	---
7	C02	---	15	C02	---

Fig. 16.

Tuning in a Channel Temporarily

You can tune in a channel temporarily, even when it has not been preset. Use the buttons on the Full-Function side of the Remote Commander.

- 1 Press C on the Remote Commander. The indication "C" appears on the screen.
- 2 Enter the double-digit channel number using the number buttons (e.g. for channel 4, first press 0, then 4). The channel appears. However, the channel will not be stored.



MANUAL PROGRAMME PRESET

Skipping Programme Positions

You can skip unused programme positions when selecting programmes with the PROGR +/- buttons. However, the skipped programmes may still be called up when you use the number buttons.

- 1 Press MENU to display the main menu.
- 2 Select Preset with Δ + or ∇ - and press OK. The PRESET menu appears.
- 3 Select Manual Programme Preset with Δ + or ∇ - and press OK. The MANUAL PROGRAMME PRESET menu appears. (See Fig. 17.)
- 4 Using Δ + or ∇ -, select the programme position which you want to skip and press OK. The "SYSTEM" position changes colour.
- 5 Press Δ + or ∇ - until --- appears in the SYSTEM position. (See Fig. 18.)
- 6 Press OK. (See Fig. 19.) When you select programmes using the PROGR +/- buttons, the programme position will be skipped.
- 7 Repeat steps 4 to 6 to skip other programme positions.



MANUAL PROGRAMME PRESET				
PROG	SYS	CH	SEARCH	LABEL AFT
1	I	C21	(off)	---- (on)
2	I	C24	(off)	---- (on)
3	I	C25	(off)	---- (on)
4	I	C27	(off)	---- (on)
5	I	C28	(off)	---- (on)
6	I	C22	(off)	---- (on)
7	I	C26	(off)	---- (on)
8	I	C25	(off)	---- (on)
9	I	C23	(off)	---- (on)
10	I	C29	(off)	---- (on)

Fig. 17.

3	---
---	-----

Fig. 18.

3	---
4	I

Fig. 19.

MANUAL PROGRAMME PRESET

Captioning a Station Name

Programme names are automatically taken from Teletext if available. However you can also "name" a channel or an input video source using up to five characters (letters or numbers) to be displayed on the TV screen (e.g. BBC1). Using this function, you can easily identify which channel or video source you are watching.

- 1 Press MENU to display the main menu.
- 2 Select Preset with Δ + or ∇ - and press OK. The PRESET menu appears.
- 3 Select Manual Programme Preset with Δ + or ∇ - and press OK. The MANUAL PROGRAMME PRESET menu appears. (See Fig. 20.)
- 4 Using Δ + or ∇ -, select the programme position you want to caption and press OK repeatedly until the first element of the LABEL position is highlighted.
- 5 Select a letter or number with Δ + or ∇ - and press OK. The next element will be highlighted. Select other characters in the same way. If you want to leave an element blank, select - and press OK. (See Fig. 21.)
- 6 After selecting all the characters, press OK repeatedly until the cursor appears by the next programme position (at the left margin). Now the caption you chose is stored. (See Fig. 22.)
- 7 Repeat steps 5 and 6 to caption names for other channels.

If you have made a mistake:
Press \leftarrow to go back to the previous position.

To go back to main menu:
Keep pressing \leftarrow .

To go back to the normal TV picture:
Press MENU.

MANUAL PROGRAMME PRESET				
PROG	SYS	CH	SEARCH	LABEL AFT
1	I	C21	(off)	---- (on)
2	I	C24	(off)	---- (on)
3	I	C25	(off)	---- (on)
4	I	C27	(off)	---- (on)
5	I	C28	(off)	---- (on)
6	I	C22	(off)	---- (on)
7	I	C26	(off)	---- (on)
8	I	C25	(off)	---- (on)
9	I	C23	(off)	---- (on)
10	I	C29	(off)	---- (on)

Fig. 20.

2	I	C25 (off)	S---	(on)
---	---	-----------	------	------

Fig. 21.

2	I	C25 (off)	SONY	(on)
---	---	-----------	------	------

Fig. 22.

MANUAL PROGRAMME PRESET

Manual Fine-Tuning

Normally, the AFT (automatic fine-tuning) is already operating. However, if the picture is distorted, you can use the manual fine tuning function to obtain better picture reception.

- 1 Press MENU to display the main menu.
- 2 Select Preset with Δ + or ∇ - and press OK. The PRESET menu appears.
- 3 Select Manual Programme Preset with Δ + or ∇ - and press OK. The MANUAL PROGRAMME PRESET menu appears. (See Fig. 23.)
- 4 Using Δ + or ∇ -, select the programme position corresponding to the channel which you want to manually fine-tune, and press OK repeatedly until the AFT position changes colour.
- 5 Fine-tune the channel with Δ + or ∇ - so that you get the best TV reception. As you press the cursor buttons, the frequency changes from -15 to +15. (See Fig. 24.)
- 6 After fine tuning, press OK. The cursor appears beside the next programme position (at the left margin). (See Fig. 25.) Now the fine-tuned level is stored.
- 7 Repeat steps 4 to 6 to fine-tune other channels.

To reactivate AFT (automatic fine tuning): Repeat from the beginning and select "ON" in step 5.

MANUAL PROGRAMME PRESET					
PROG	SYS	CH	SEARCH	LABEL	AFT
1	I	C21	(off)	----	(on)
2	I	C24	(off)	----	(on)
3	I	C25	(off)	----	(on)
4	I	C27	(off)	----	(on)
5	I	C28	(off)	----	(on)
6	I	C22	(off)	----	(on)
7	I	C26	(off)	----	(on)
8	I	C25	(off)	----	(on)
9	I	C23	(off)	----	(on)
10	I	C29	(off)	----	(on)

Fig. 23.

2	I	C35	(off)	----	(-3)
---	---	-----	-------	------	------

Fig. 24.

2	I	C40	(off)	----	(-3)
3	I	C45	(off)	----	(on)

Fig. 25.

PARENTAL LOCK

Parental Lock

You can prevent undesirable broadcasts from appearing on the screen. We suggest you use this function to prevent children from watching programmes which you consider unsuitable.

- 1 Press MENU to display the main menu.
- 2 Select Preset with Δ + or ∇ - and press OK. The PRESET menu appears.
- 3 Select Parental Lock with Δ + or ∇ - and press OK. The PARENTAL LOCK menu appears. (See Fig. 26.)
- 4 Using Δ + or ∇ -, select the programme position you want to block and press OK. The CH and LABEL, of the selected programme number, change colour indicating that this programme is now blocked. (See Fig. 27.)
- 5 Repeat step 4 to block other programme positions.

Cancelling blocking

- 1 On the PARENTAL LOCK menu, select the programme position you want to unblock with Δ + or ∇ -. Press OK. The CH and LABEL change to normal colour indicating that the blocking has been cancelled.

If you try to select a programme that has been blocked: The message "LOCKED" appears on the blank TV screen.

PARENTAL LOCK					
PROG	CH	LABEL	PROG	CH	LABEL
0	AV1	VHS	8	C38	---
1	C28	BBC2	9	C39	---
2	C42	BBC1	10	C40	---
3	C26	C4	11	C41	---
4	C34	ITV	12	C42	---
5	C35	---	13	C43	---
6	C36	---	14	C44	---
7	C37	---	15	C45	---

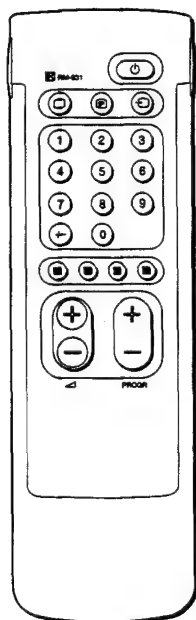
Fig. 26.


PROG	CH	LABEL	PROG	CH	LABEL
0	AV1	VHS			
1	C28	BBC2			
2	C42	BBC1			
3	C26	C4			


Fig. 27.

Operating Instructions

Watching the TV



If no picture appears when you depress  on the TV

and if the standby indicator on the TV is lit, the TV is in standby mode. Press  or one of the number buttons to switch it on.

This section explains the basic functions you use while watching TV. Most of the operations can be done using the simple side of the Remote Commander.

Switching the TV on and off

Switching on



Depress  on the TV.

Switching off temporarily


Press  on the Remote Commander.

The TV enters standby mode and the standby indicator on the front of the TV lights up.

To switch on again

Press , PROG , or one of the number buttons on the Remote Commander.

Switching off completely


Depress  on the TV.

Selecting TV Programmes

Press PROG  or press number buttons.

To select a double-digit number

Press , then the numbers.








For example, if you want to choose 23, press , 2, and 3.

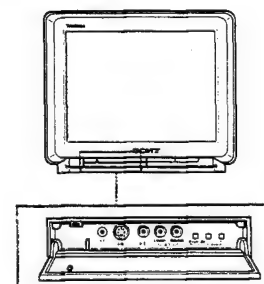
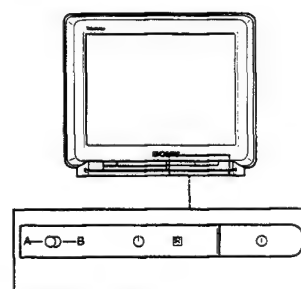
Adjusting the Volume

Press  .

Operating the TV Using the Buttons on the TV

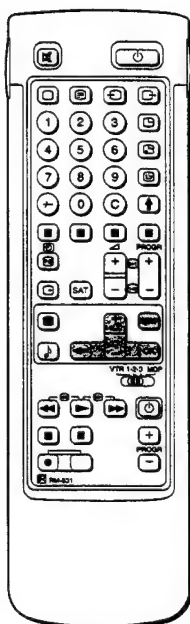
With the buttons on the TV, you can select programmes, adjust the volume, and select video input sources.

- Press  button repeatedly until the programme number,  (for volume), or  (for video input picture) appears. Then adjust with the  buttons.
- Press  buttons to switch on the TV from the standby mode.
- Press  simultaneously to reset picture and sound controls to the factory preset level (RESET symbol  is displayed).



For details of the teletext operation, refer to page 17.

For details of the video input picture, refer to page 21.



To make the Programme Table disappear
Press MENU.

Watching Teletext or Video Input

Watching teletext

- Press to view the teletext.
- Press three number buttons to select a page.
- Press one of the coloured buttons for fastext operation.
- Press (PAGE +) or (PAGE -) for the next or preceeding page.
- To go back to the normal TV picture, press .

Watching a video input picture

Press repeatedly until the desired video input appears. To go back to the normal TV picture, press .

More Convenient Functions

Use the Full-Function side of the Remote Commander.

Displaying the on screen indications

- Press once to display all the indications. They will disappear after some seconds.
- Press twice to have the programme number and label stay on screen. Press twice again to make indications disappear.

Muting the sound.

Press .

To resume normal sound, press again.

Displaying the time

Press . This function is available only when teletext is broadcast.

To make the time display disappear, press again.

Displaying of the Programme Table

Press OK. A Programme Table will be displayed on the right side of the TV screen (See. Fig.28)

Selecting of TV programmes

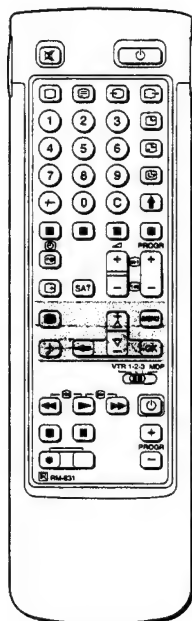
Press PROGR +/- or select the desired programme position using or and press OK.

▶ 1	ARD
2	SAT
3	TVS
4	C02
5	C15
6	RTL
7	SKY
8	S34
9	AVI
10	MTV

Fig.28.

Adjusting and Setting the TV Using the Menu

PICTURE CONTROL SOUND CONTROL



If you have made a mistake:
Press \leftarrow to go back to the previous position.
To go back to the main menu:
Keep pressing \leftarrow .
To go back to the normal TV picture:
Press MENU.

Note:
HUE is only available for NTSC colour system.

Note on LINE OUT:
The audio level and the dual sound mode output from the G- jack on the rear correspond to the HEADPHONES VOLUME and DUAL SOUND settings.

When watching a video input source with stereo sound:
You can select DUAL SOUND to change the sound.

Adjusting the Picture and Sound

Although the picture and sound are adjusted at the factory, you can adjust them to suit your own taste. In addition, you can change the aspect ratio of the TV display for wide screen effect. You can also select dual sound (bilingual) programmes when available or adjust the sound for listening with the headphones (H).

- 1 Press \blacksquare (for picture) or \mathbb{N} (for sound) on the Remote Commander.
or
Press MENU and select Picture Control or Sound Control, then press OK.
The PICTURE CONTROL or SOUND CONTROL menu appears. (See Fig. 29 or Fig. 30)
- 2 Using Δ + or ∇ -, select the item you want to adjust and press OK. The selected item changes colour. (See Fig. 31)
- 3 Adjust the setting with Δ + or ∇ - and press OK.
The cursor appears beside the next item (at the left margin). (See Fig. 32)
For the effect of each control, see the table below.
- 4 Repeat steps 2 and 3 to adjust other items.

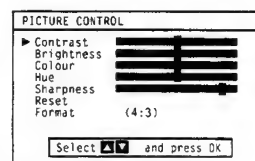


Fig. 29.

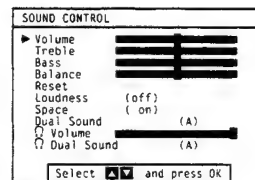


Fig. 30.

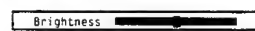


Fig. 31.

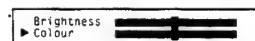


Fig. 32.

Effect of each control











PICTURE CONTROL	Effect
Contrast	Less — — More
Brightness	Darker — — Brighter
Colour	Less — — More
Hue	Greenish — — Reddish
Sharpness	Softer — — Sharper
Reset	Resets picture to the factory preset levels.
Format	4 : 3 : Normal 16 : 9 : Wide screen effect

SOUND CONTROL	Effect
Volume	Less — — More
Treble	Less — — More
Bass	Less — — More
Balance	More left — — More right
Reset	Resets sound to the factory preset levels.
Loudness	off : Normal on : When listening to low volume sound.
Space	off : Normal on : Obtain acoustic sound effect.
Dual Sound	A : left channel B : right channel stereo mono The selected mode of the A-CD-B indicator on the TV lights up. (for NICAM broadcasts see next page)
Headphones:	
H Volume	Less — — More
H Dual Sound	A : left channel B : right channel STEREO MONO

Selecting Nicam Broadcasts*

This Sony TV has been designed to select Nicam broadcasts when available. Whenever a Nicam broadcast is received, "NICAM" appears briefly on the screen. When the Nicam programme ends, or you switch channels to one without Nicam, the A-CD-B indicators, on the TV will switch off.

Nicam programmes can be broadcast in two ways. You may select the sound you want to hear in either of these by first following the instructions explained on page 15.

Service Being Broadcast	Action	Effect	Indication on the TV A-CD-B
Stereo	Press Δ + or ∇ -	Stereo Nicam (Mono 2-Channel) mono	   
Press Δ + or ∇ - again to return to stereo Nicam (mono 2-channel)			
Bilingual	press Δ + or ∇ -	Channel A Nicam Channel B Nicam mono	     
Press Δ + or ∇ - again to return to channel A Nicam			

* Depending on availability of service.

PROGRAMME TABLE

To go back to the normal TV picture:
Press MENU.

Using the Programme Table

On this table, you can see which channel is preset to which programme position. You can also select programmes using this table.

- From the main menu, select Programme Table with Δ + or ∇ - and press OK.
The PROGRAMME TABLE menu appears. (See Fig. 33)
To scroll to higher programme numbers, press ∇ -.
- To select a programme using this menu select the programme number with Δ + or ∇ - and press OK.
The selected programme appears.

PROGRAMME TABLE			
PROG CH	LABEL	PROG CH	LABEL
1 C21	---	11 C38	---
2 C24	---	12 C40	---
3 C26	---	13 C41	---
4 C27	---	14 C43	---
5 C23	---	15 C54	---
6 C22	---	16 C55	---
7 C32	---	17 C56	---
8 C36	---	18 C57	---
9 C38	---	19 C48	---
10 C39	---	20 C46	---

Fig. 33.

TIMER

To switch off the timer:
Select "OFF" in step 3.

To check the remaining time:
Press \odot .

Using the Sleep Timer

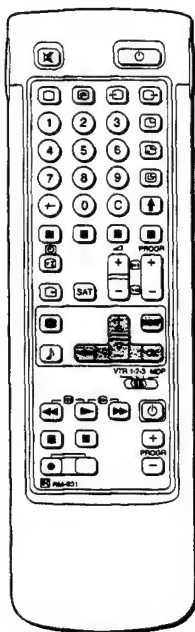
You can select a time period after which the TV automatically switches into standby mode.

- From the main menu, select Timer with Δ + or ∇ - and press OK.
The TIMER menu appears. (See Fig. 34.)
- Press OK.
The time period option changes colour.
- Select the time period with Δ + or ∇ -.
The time period (in minutes) changes as follows:
10 \rightarrow 20 \rightarrow 30 \rightarrow 40 \rightarrow 50 \rightarrow 60 \rightarrow 70 \rightarrow 80 \rightarrow 90
 \uparrow _____ OFF _____
- After selecting the time period, press OK.
The cursor moves back to the left margin and the timer starts counting.
One minute before the TV switches into standby mode, a message is displayed on the screen.

TIMER	
\blacktriangleright Sleep Timer (off)	
Select \blacktriangleright and press OK	

Fig. 34.

Teletext



Note:
Teletext errors may occur if the broadcasting signals are weak.

With the simple side of the Remote Commander:

You can switch teletext on and off, operate Fasttext, and directly select page numbers.

Note:
Fasttext operation is only possible, if the TV station broadcasts Fasttext signals.

TV stations broadcast an information service called Teletext via the TV channels. Teletext service allows you to receive various information pages such as weather reports or news at any time you want. For advanced teletext operation, use the buttons on the Full-Function side of the Remote Commander.

Direct Access Functions

Switching Teletext on and off

- 1 Select the TV channel which carries the teletext broadcast you want to watch.
- 2 Press to switch on teletext.
A teletext page will be displayed (usually the index page). If there is no teletext broadcast, "No text available" is displayed on the information line at the top of the screen.

To switch teletext off

Press .

Selecting a teletext page

With direct page selection

Use the number buttons to input the three digits of the chosen page number.

If you have made a mistake, type in any three digits. Then re-enter the correct page number.

With page-catching

- 1 Select a teletext page with a page overview (e.g. index page).
- 2 Press OK. Using or , select the desired page. "Page Catching" will be displayed on the information line. Press OK. The requested page will appear in a few seconds.

Press to resume normal teletext reception.

Accessing next or preceding page

Press (PAGE +) or (PAGE -).

The next or preceding page appears.

Superimposing the teletext display on the TV programme

- Press once in teletext mode or twice in TV mode.
- Press again to resume normal teletext reception.

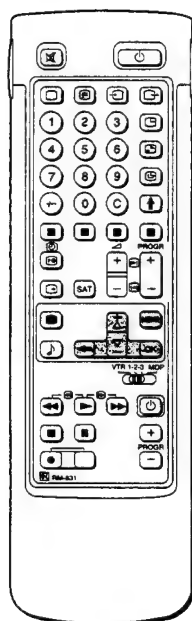
Preventing a teletext page from being updated

- Press (HOLD). The HOLD symbol " " is displayed on the information line.
- Press to resume normal teletext reception.

Using Fasttext

With Fasttext you can access pages with one key stroke. When a Fasttext page is broadcast, a colour-coded menu will appear at the bottom of the screen. The colours of this menu correspond to the red, green, yellow and blue buttons on the Remote Commander.

Press the corresponding coloured button on the Remote Commander which corresponds to the colour-coded menu. The page will be displayed after some seconds.



Note:
Some of the features may not be available depending on the Teletext service.

Note on Subtitles:
If the subtitles are not broadcast on page 888, please select the subtitle page using the number buttons.

To cancel the request:
Select "Subpage" and press OK.

Using the Teletext Menu

This TV is provided with a menu-guided teletext system. When teletext is switched on, you can use the menu buttons to operate the teletext menu. Select the teletext menu functions in the following way:

- 1 Press MENU. The menu will be superimposed on the teletext display. (See Fig. 35)
- 2 Using Δ + or ∇ -, select the teletext function you want and press OK. (See Fig. 36)

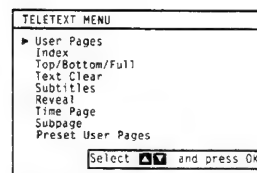


Fig. 35.

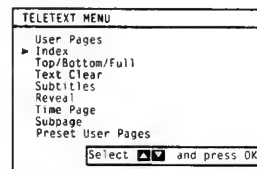


Fig. 36.

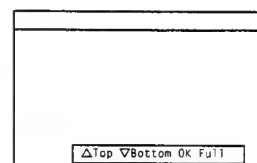


Fig. 37.

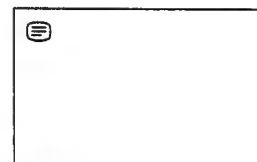


Fig. 38.

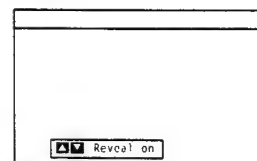


Fig. 39.

USER PAGES/PRESET USER PAGES

See page 19 for information about presetting and operating the user pages.

INDEX

The index will give you an overview of the contents of the teletext and the page numbers.

TOP/BOTTOM/FULL

For convenient reading of a teletext page, you can enlarge the teletext display with the ability to scroll up and down the screen. After having selected the function, an information line Top/Bottom/Full will be displayed. (See Fig. 37)

Press Δ + for Top to enlarge the upper half. For Bottom keep pressing ∇ -, to enlarge the lower half. Press OK for Full to resume the normal size.

Press OK to resume normal teletext reception.

TEXT CLEAR

After having selected the function, you can watch a TV programme while waiting for a requested teletext page to be captured (The symbol changes colour) (see Fig. 38).

Press OK to view the requested page.

SUBTITLES

Your teletext service will inform you if a TV programme is subtitled. After having selected the function the subtitles will be displayed.

REVEAL

Sometimes pages contain concealed information, such as answers to a quiz. The reveal option lets you disclose the information. After having selected the function, an information line "REVEAL ON/OFF" will be displayed. (See Fig. 39)

Using Δ + or ∇ -, select ON to reveal the information or OFF to conceal it again.

Press OK to resume normal teletext reception.

TIME PAGE

This function is not available.

SUBPAGE

You may want to select a particular teletext page from several subpages which are rotated automatically. After having selected the function, an information line will be displayed.

To select the desired subpage, enter four digits using PROG+/- or the number buttons. (e.g. enter 0002 for the second page of a sequence).

If two broadcasting stations use the same Teletext: You can preset one bank to 2 different programme positions.

User Page Bank System

You can store up to 30 pages in the "Teletext page bank system". In this way you have quick access to the pages you watch frequently.

Storing pages

There are 5 "banks" (A to E) for 5 teletext stations. In each bank you can store 6 preferred pages (P1 to P6).

- 1 Press ⏏ (if Teletext is not on already) and MENU to show the TELETEXT MENU display.
- 2 Select PRESET USER PAGES with $\Delta+$ or $\nabla-$ and press OK.
- 3 Select the desired bank with $\Delta+$ or $\nabla-$ and press OK. The cursor will go to the first position (P1) of the preferred pages.
- 4 Input the three digits of your first preferred page with the number buttons and press OK. The cursor will go to the second position.
- 5 Repeat step 4 for the other 5 page numbers you want to preset. If you do not want to preset all 6 page numbers available, press OK without inserting any number. After having finished the presetting press OK repeatedly until the cursor appears besides the next bank at the left margin.
- 6 Select Allocate Bank with $\Delta+$ or $\nabla-$ and press OK.
- 7 Select the programme position for which you have preset pages with $\Delta+$ or $\nabla-$ and press OK. (See Fig. 40)
- 8 Select the desired bank with $\Delta+$ or $\nabla-$ (Banks A to E are available) and press OK.
- 9 Repeat steps 3 to 8 for the other 4 banks available.

Displaying User Pages

- 1 Select MENU.
- 2 Select User Pages with $\Delta+$ or $\nabla-$ and press OK. A table of the stored preferred pages will be displayed. (See Fig. 41)
- 3 Select the desired page with $\Delta+$ or $\nabla-$ and press OK. The page will be displayed after some seconds.

You can use the coloured buttons on the Remote Commander to have quick access to the first four User pages. Page 1 corresponds to the red button, P 2 to the green one, P 3 to the yellow one and P 4 to the blue button.

To select the desired page press the respective coloured button while you are in TV mode. Now the Page number of this teletext page will appear in white at the top in the left-handed corner of the TV screen. When the page number changes colour, the page is available. Press the coloured button again to display the page.

PRESET USER PAGES						
BANK	P1	P2	P3	P4	P5	P6
A	300	255	456	234	200	179
B	200	120	301	303	550	345
C	100	220	300	444		
D	128	321	255			
E	400	238	240	118	127	

Allocate Bank					
PROG LABEL	BANK	PROG LABEL	BANK		
00	VHS	-	04	MTV	D
01	BBC1	A	05	SKY	B
02	BBC2	C	06	ITV	C

Select ⏏ and press OK

Fig. 40.

USER PAGES - BANK B	
▶ PAGE 300	
PAGE 200	
PAGE 203	
PAGE 500	
PAGE 234	
PAGE 159	

Select ⏏ and press OK

Fig. 41.

Connecting and Operating Optional Equipment

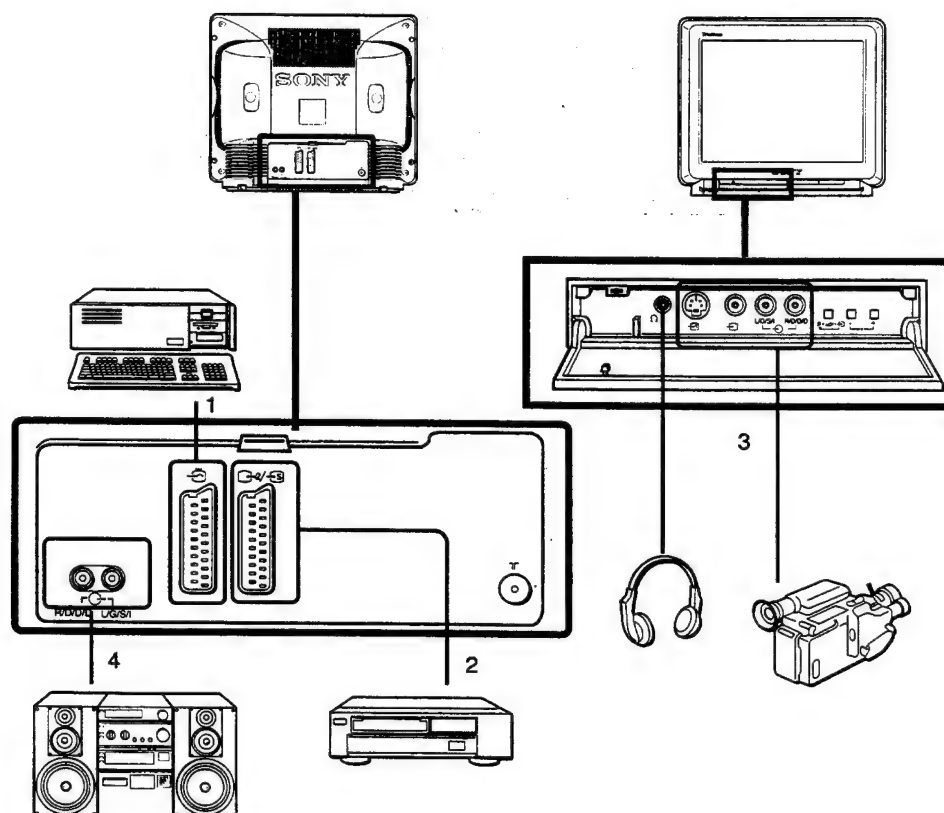
Connecting Optional Equipment

You can connect optional audio-video equipment to this TV such as VTRs, video disc players, and stereo systems.

To connect a VTR using the $\overline{\text{I}}$ terminal:
Connect the aerial output of the VTR to the aerial terminal $\overline{\text{I}}$ of the TV.

We recommend that you tune in the signal to programme number "0". For details see "Preset Channels Manually" on page 8.

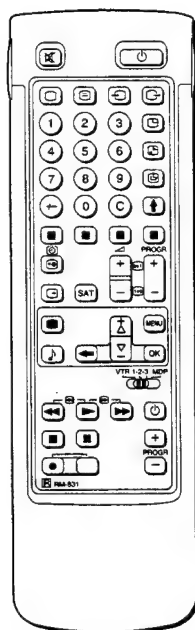
If the picture or the sound is distorted:
Move the VTR away from the TV.



S video input (Y/C input):
Video signals may be separated into Y (luminance or brightness) and C (chrominance) signals. Separating the Y and C signals prevents them from interfering with one another, and therefore improves picture quality (especially luminance). This TV is equipped with 2 S Video input jacks through which these separated signals can be input directly.

When connecting a monaural VTR:
Connect only the white \ominus jack to both the TV and VTR.

Acceptable input signal	Available output signal
1 Normal audio/video and RGB signal	Video/audio from TV tuner
2 Normal audio/video and S video signal	Video/audio from selected source
3 Normal audio/video and S video signal	No outputs
4 No inputs	Audio signal (variable)



When recording
When you use the ● (record) button, make sure to press this button and the one to the right of it simultaneously.

Checking and selecting the input and output sources using the menu

You can display the menu to see which input sources are selected for the TV screen, and which output source is selected. You can also select them on the menu display.

- 1 Select Video Connection with Δ + or ∇ - and press OK. The VIDEO CONNECTION menu appears. (See Fig. 42)

You can see which source is selected for the TV and for the output. If you want to select the input and output on this menu, go on to the next step.

- 2 Select TV Screen (input source for the TV screen) or output (output source) with Δ + or ∇ - and press OK. One of the source items changes colour. (See Fig. 43)
- 3 Select the desired source with Δ + or ∇ -.
(See Fig. 44)
For details about each source, see the table on page 21.
- 4 Press OK.
The selected source is confirmed, and the cursor appears. (See Fig. 45)
- 5 Repeat steps 2 to 4 to select the source for other inputs or outputs.

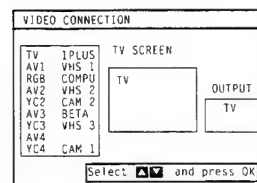


Fig. 42.

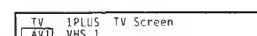


Fig. 43.

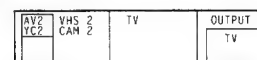


Fig. 44.

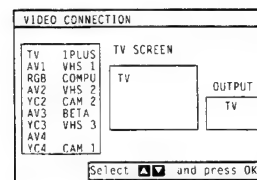


Fig. 45.

Remote Control of Other Sony Equipment

You can use the TV Remote Commander to control most Sony remote-controlled video equipment such as: Beta, 8mm or VHS VTRs or video disc players.

Tuning the Remote Commander to the equipment

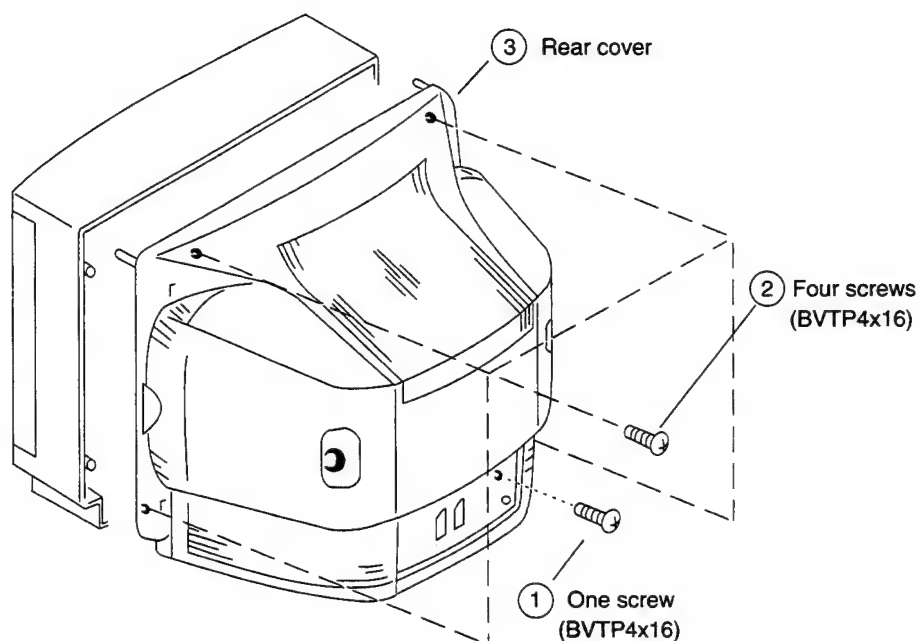
- 1 Set the VTR 1/2/3 MDP selector according to the equipment you want to control:
VTR 1: Beta or ED Beta VTR
VTR 2: 8mm VTR
VTR 3: VHS VTR
MDP: Video disc player
- 2 Use the buttons indicated in the illustration to operate the additional equipment.

If your video equipment is furnished with a COMMAND MODE selector: set this selector to the same position as the VTR 1/2/3 MDP selector on the TV Remote Commander.

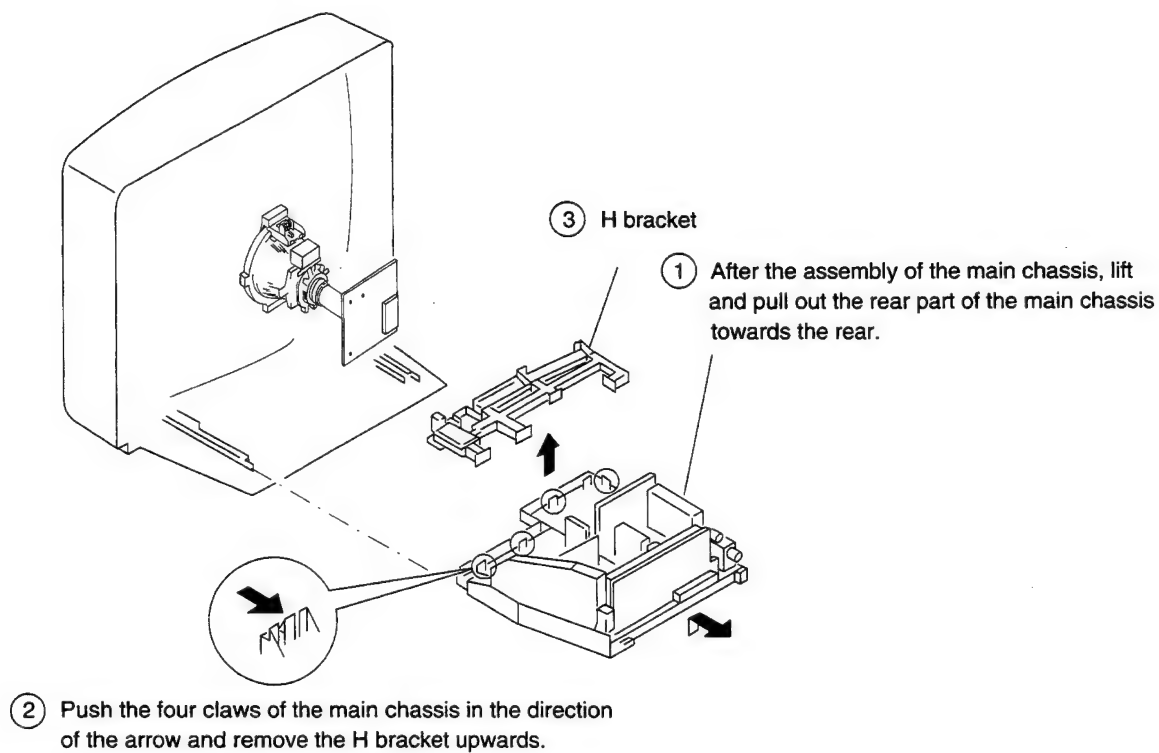
If the equipment does not have a certain function, the corresponding button on the Remote Commander will not operate.

SECTION 2 DISASSEMBLY

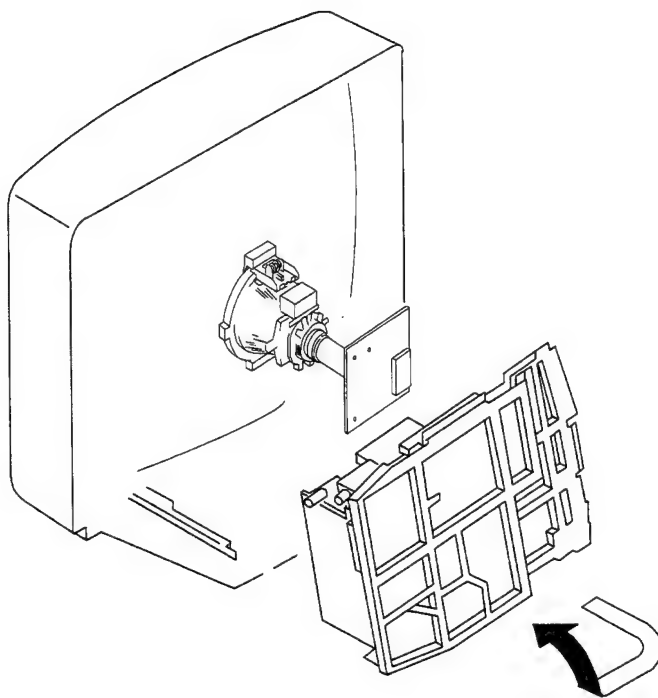
2-1. REAR COVER REMOVAL



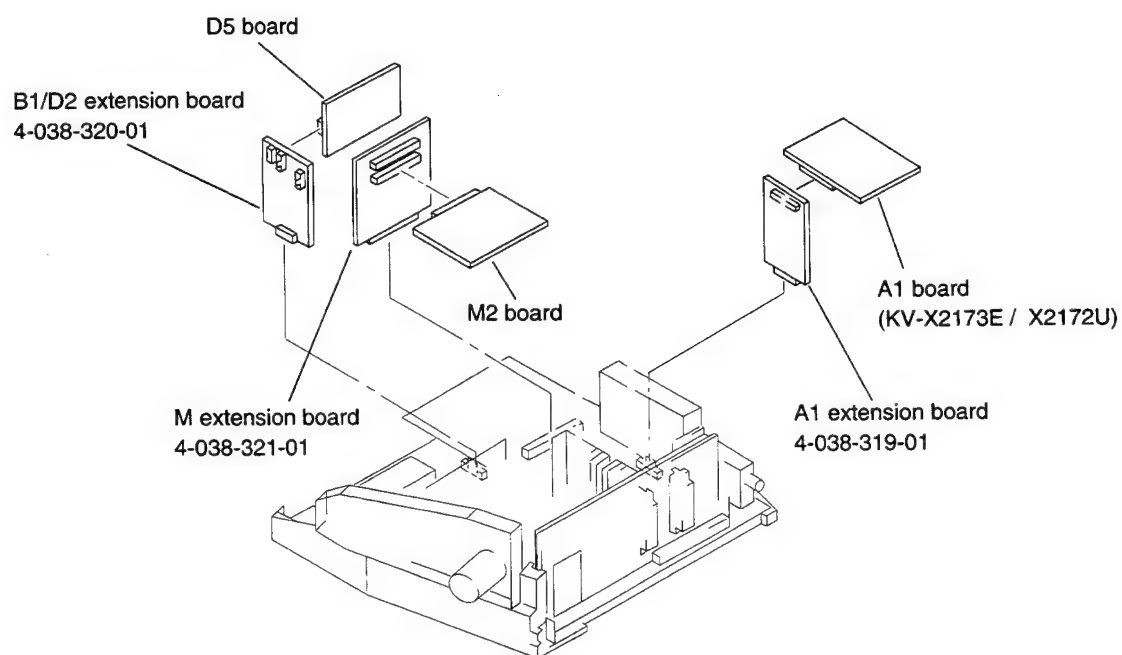
2-2. CHASSIS ASSY REMOVAL



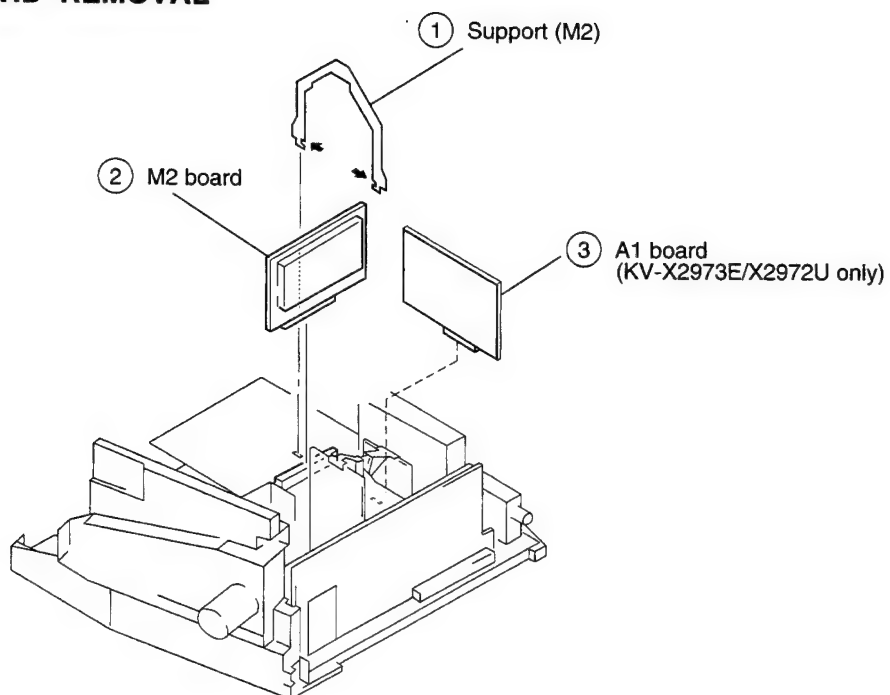
2-3. SERVICE POSITION



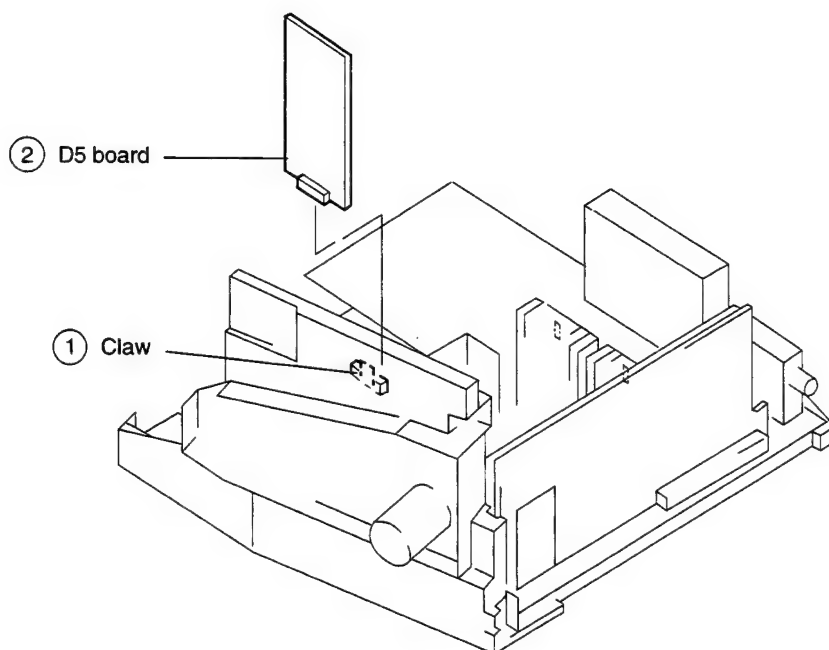
2-4. EXTENSION BOARDS



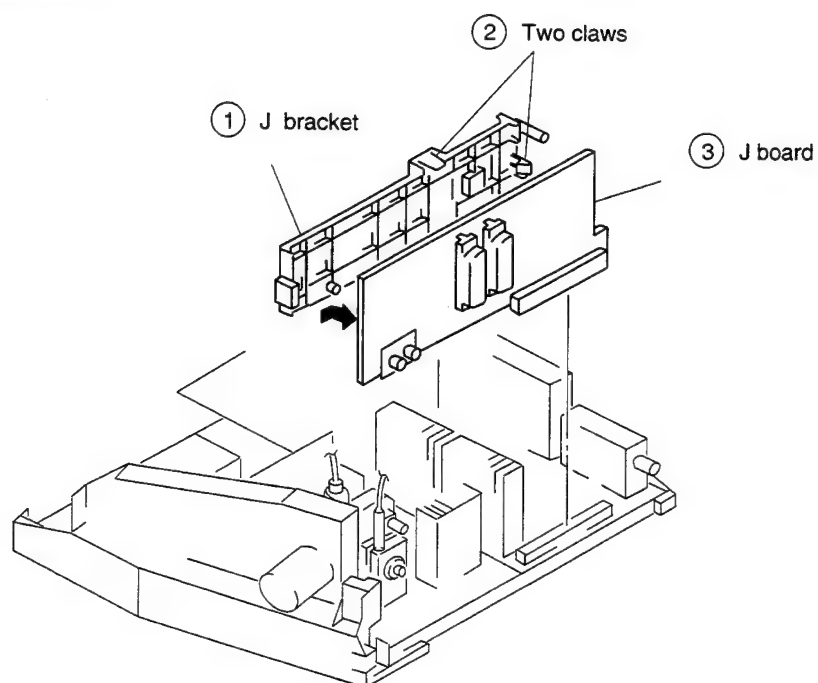
2-5. M2 AND A1 BOARD REMOVAL



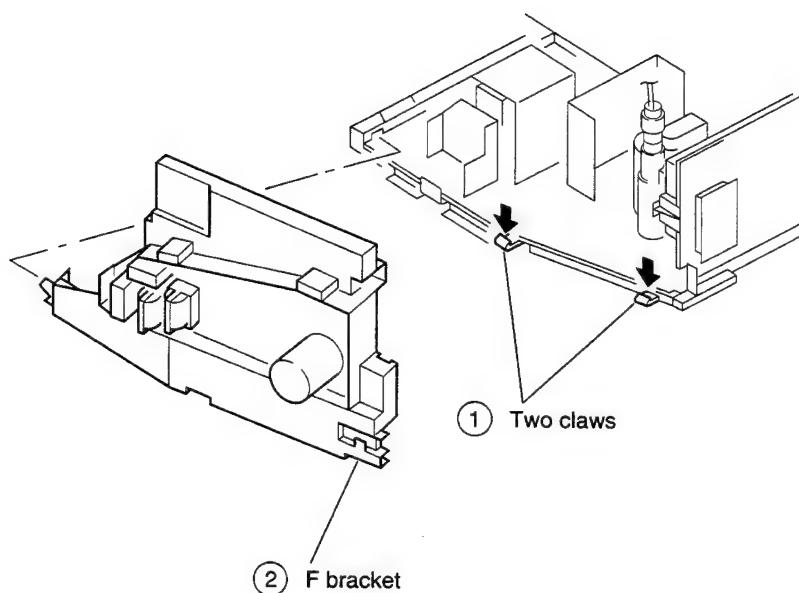
2-6. D5 BOARD REMOVAL



2-7. J BOARD REMOVAL

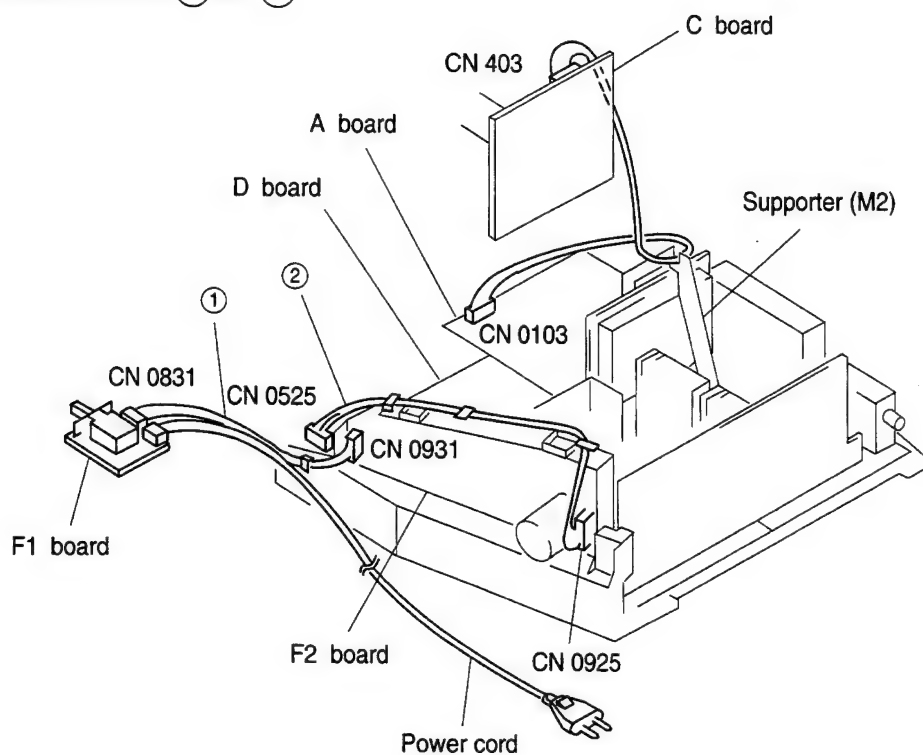


2-8. F BRACKET REMOVAL

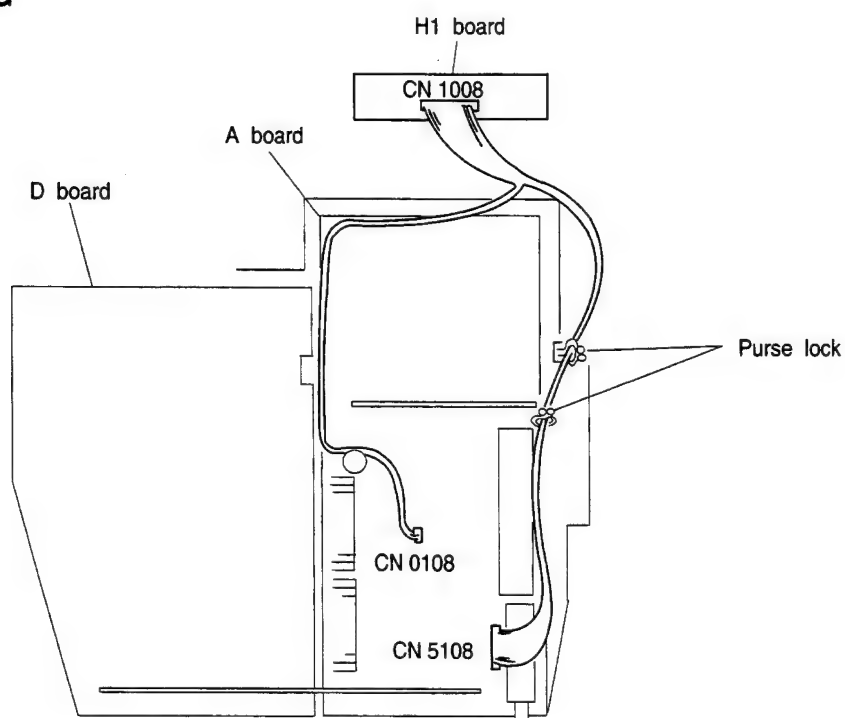


2-9-1. WIRE DRESSING

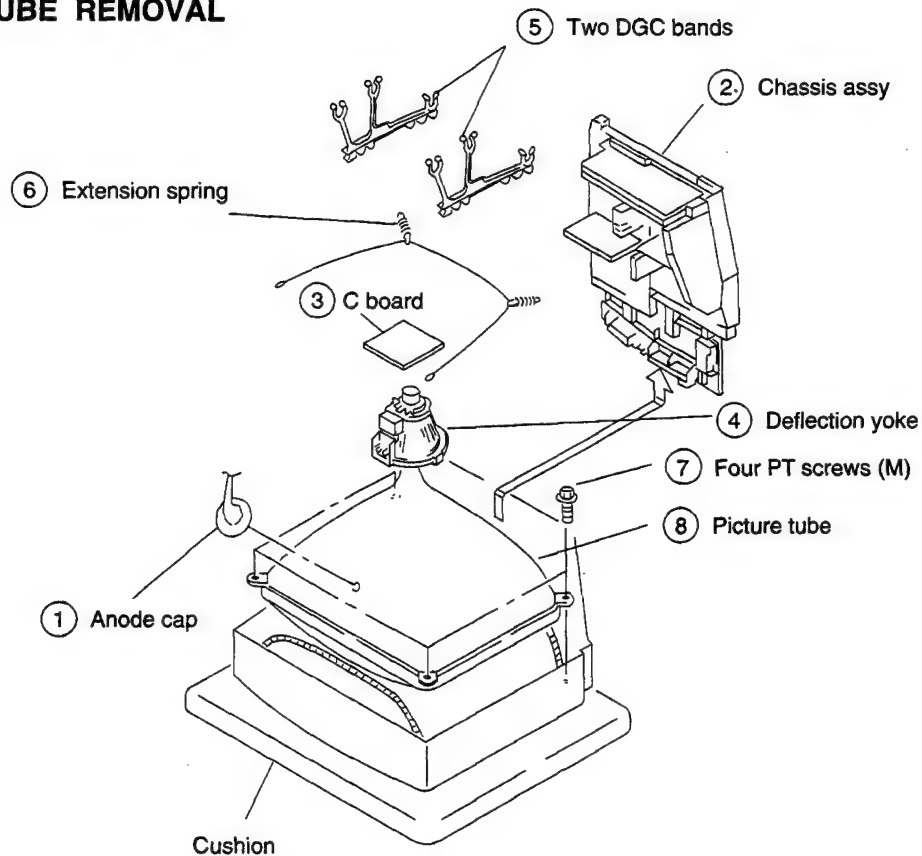
* Keep distance between ① and ②



2-9-2. WIRE DRESSING



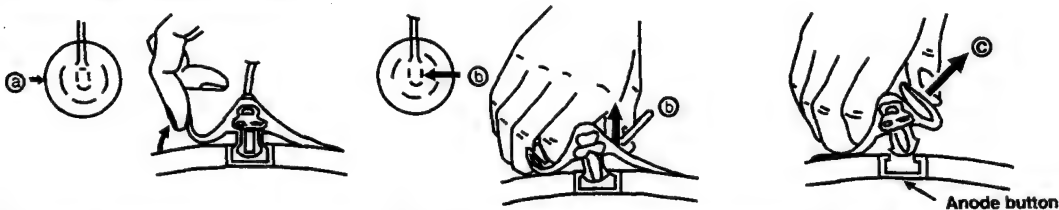
2-10. PICTURE TUBE REMOVAL



• REMOVAL OF ANODE-CAP

Note: Short circuit the anode of the picture tube and the anode cap to the metal chassis, CRT shield or carbon paint on the CRT, after removing the anode.

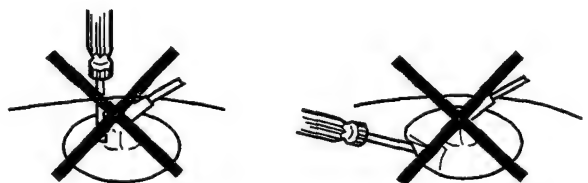
* REMOVING PROCEDURES.



- ① Turn up one side of the rubber cap in the direction indicated by the arrow (a)
- ② Using a thumb pull up the rubber cap firmly in the direction indicated by the arrow (b)
- ③ When one side of the rubber cap is separated from the anode button, the anode-cap can be removed by turning up the rubber cap and pulling it up in the direction of the arrow (c)

• HOW TO HANDLE AN ANODE-CAP

- ① Don't damage the surface of anode-cap with sharp shaped material !
- ② Don't press the rubber hardly not to hurt inside of anode-caps !
A metal fitting called as shatter-hook terminal is built into the rubber.
- ③ Don't turn the foot of rubber over hardly !
The shatter-hook terminal will stick out or damage the rubber.



SECTION 3

SET-UP ADJUSTMENTS

- The following adjustments should be made when a complete realignment is required or a new picture tube is installed.
 - These adjustments should be performed with rated power supply voltage unless otherwise noted.
- The controls and switch below should be set as follows unless otherwise noted :

● CONTRAST control..... 80%(or Normal by commander)
 ☆ BRIGHTNESS control..... 50%

Perform the adjustments in order as follows:

Preparation:

- Set the side of the unit with the PICTURE TUBE so that it faces east or west in order to reduce the influence of external magnetic force.
- Turn the power switch for the unit ON and erase the magnetic force using a degausser..

3-1. BEAM LANDING

Demagnetize with a degausser

1. Input a raster signal with the pattern generator.
 CONTRAST }
 BRIGHTNESS } normal
2. Turn the raster signal of the pattern generator to red.
3. Move the deflection yoke backward, and adjust with the purity control so that red is in the center and blue and green are at the sides evenly.
 (Fig.3-1 - 3-3)
4. Move the deflection yoke forward, and adjust so that the entire screen becomes red. (Fig.3-1)
5. Switch over the raster signal to blue and blue and confirm the condition.
6. When the position of the deflection yoke is determined, tighten it with a deflection yoke mounting screw.
7. When landing at the corner is not right, adjust by using the disk magnets. (Fig.3-4)

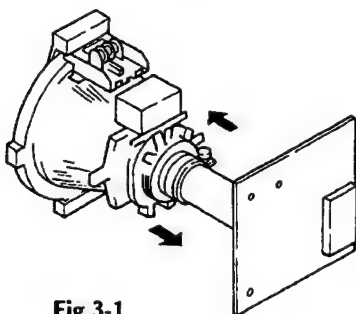


Fig.3-1

1. Beam Landing
2. Convergence
3. Focus
4. Screen (G 2) and White Balance

Note: Test Equipment Required.

1. Color bar/Pattern Generator
2. Degausser
3. DC Power Supply
4. Digital multimeter
5. Oscilloscope

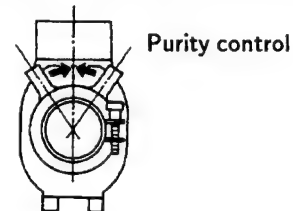


Fig.3-2

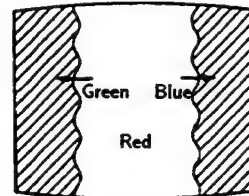


Fig.3-3

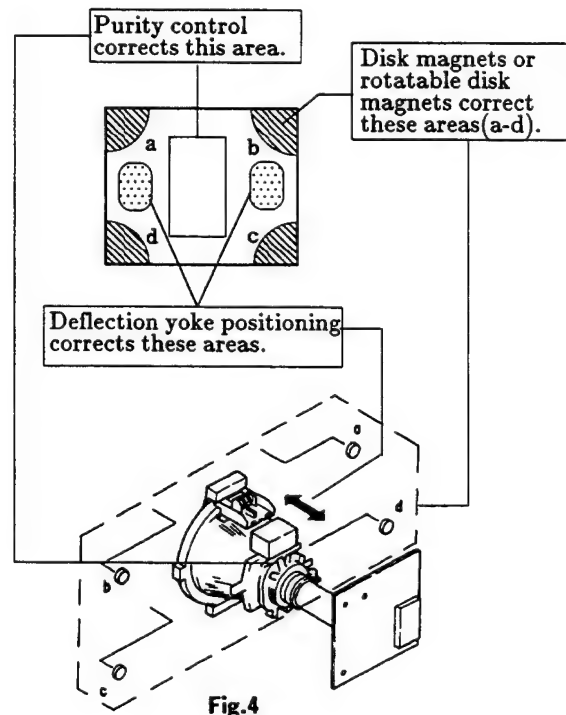


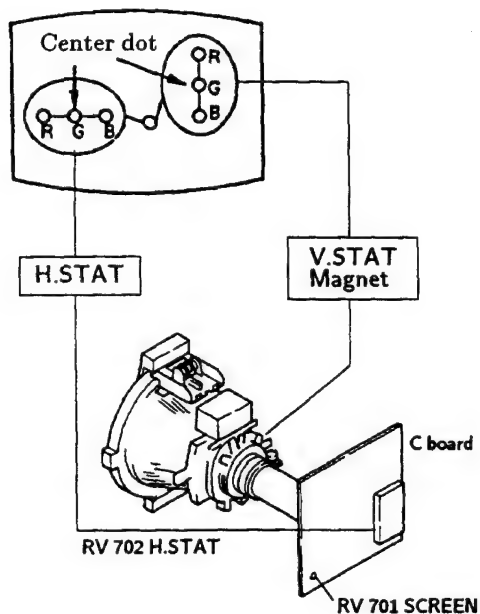
Fig.4

3-2. CONVERGENCE

Preparation:

- Before starting, perform FOCUS, H.SIZE, and V. SIZE adjustments.
- Set BRIGHTNESS control to minimum.
- Feed in the dot pattern.

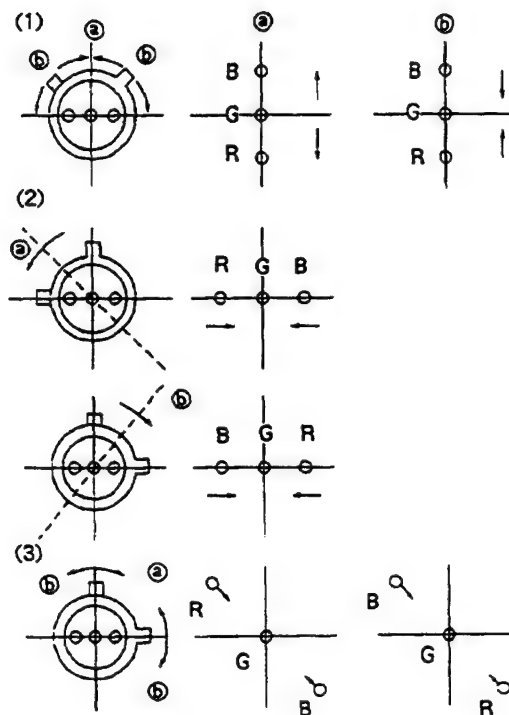
(1) Horizontal and Vertical Static Convergence



1. Adjust H.STAT VR to converge red, green and blue dots the in center of the screen.(Horizontal movement)
 2. Adjust V. STAT magnet to converge red, green and blue dots in the center of the screen. (Vertical movement)
 3. If the red, green and blue dots do not converge on the center of screen with H.STAT VR, perform horizontal convergence adjustment using H.STAT VR and V.STAT magnet as shown below. (In this case, H.STAT VR and V.STAT magnet effect each other.)
- Tilt the V.STAT magnet and adjust static convergence to open or close the V.STAT magnet.



4. When the V.STAT magnet is moved in the direction of arrow ② and ③, red, green and blue dots move as shown below.

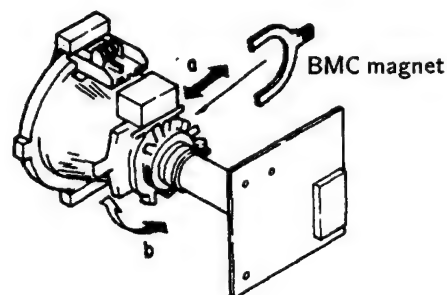


If the red and blue dot do not converge with green dots, perform following steps.

Move BMC magnet (a) to correct insufficient H.static convergence.

Rotate BMC magnet (b) to correct insufficient V.static convergence.

In either case, repeat Beam Landing Adjustment.



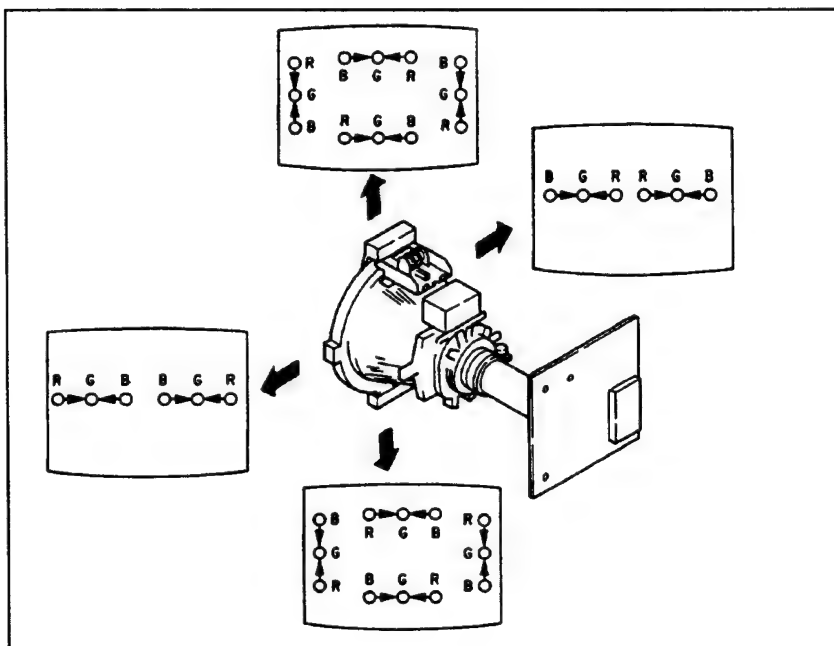
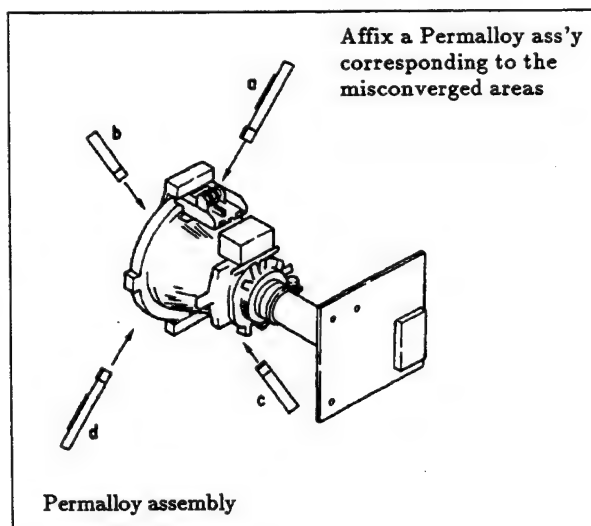
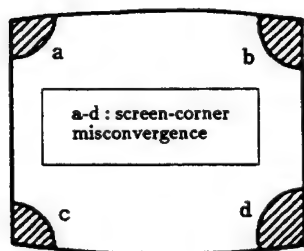
(2) Dynamic Convergence Adjustment**Preparation:**

● Before starting perform Horizontal and Vertical static convergence Adjustment.

1. Slightly loosen deflection yoke screw.
2. Remove deflection yoke spacers.

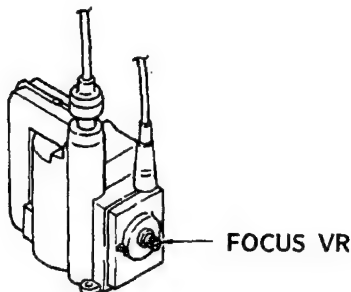
3. Move the deflection yoke for best convergence as shown below.

4. Tighten the deflection yoke screw.
5. Install the deflection yoke spacers.

**(3) Screen-corner Convergence**

3-3. FOCUS

Adjust FOCUS so that the whole screen is in best focus.



3-4. WHITE BALANCE

Screen G2 Setting

1. Input the dot signal from the pattern generator.
2. Set the picture brightness control to its lowest level.
3. Apply 180V DC to the R,G, and B cathodes with an external power supply.
4. While watching the picture, adjust G 2 control RV 701 (Screen) to the point just before the return lines disappear.

White balance adjustment

1. Receive all-white signal.
2. Enter into service mode. (Refer to the section 4 "Electrical Adjustment" to how to enter service mode.)
3. Select CXA 1587 on menu.

09	SUB BRIGHT	ADJ.
10	SUB HUE	7
11	VM LEVEL	2
12	NR LEVEL	0
13	ABL MODE	0
14	G-DRIVE	ADJ.
15	B-DRIVE	ADJ.
16	G-AUTO CUT OFF	ADJ.
17	B-AUTO CUT OFF	ADJ.
18	R-MANUAL CUT OFF	ADJ.
19	G-MANUAL CUT OFF	ADJ.
20	B-MANUAL CUT OFF	ADJ.

4. Set picture to MAX.
5. Adjust G-DRIVE B-DRIVE with , buttons so that the white balance becomes optimum.
6. Press button to write the data for each item.
7. Set picture to MIN.
8. Adjust G-AUTO CUT OFF, B-AUTO CUT OFF, R-MANUAL CUT OFF, G-MANUAL CUT OFF and B-MANUAL CUT OFF with , buttons so that the white balance becomes optimum.
9. Press button to write the data for each item.

SECTION 4

CIRCUIT ADJUSTMENTS

4-1. ELECTRICAL ADJUSTMENTS

Service adjustment to this model can be performed with the supplied remote commander RM-831

HOW TO ENTER INTO SERVICE MODE

1. Turn on the main power switch of the set while pressing any two buttons on the front panel.

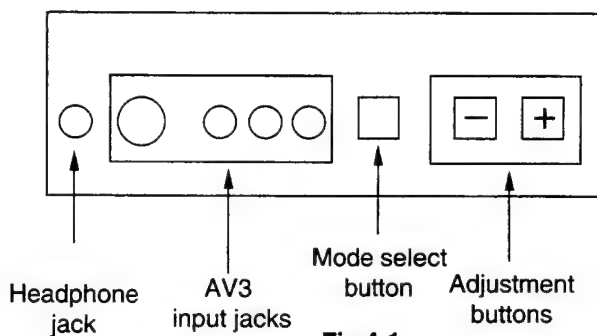


Fig.4-1

2. "TT" will appear at the upper right corner of the screen.

Command operation in service mode.

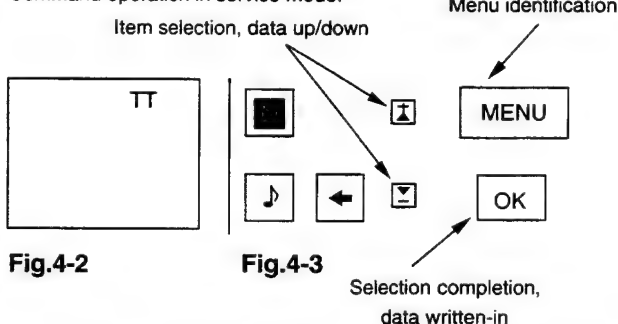


Fig.4-2

Fig.4-3

3. Press the MENU button on the remote commander to obtain the menu on the screen.

MAIN MENU
Programme Table
Video Connection
Picture Control
Sound Control
Timer
Preset
Language
> DEMO
Select < > and press OK

Fig.4-4

4. Press the ▲ and ▼ buttons on the remote commander and move > to DEMO.
5. Press [OK] button to proceed to the next menu.
6. The menu of fig. 4-5 will appear on the screen. Select the DEVICE corresponding to the adjustment item from the table on the next page.

DEVICES
Initialize
> CXA1587
CXD2018
TDA9145
CXA1526
TDA6612
CX7948A
P/P service
Select < > and press OK

Fig. 4-5

7. If adjustment item is CXA1587, press the ▼ button and move > to CXA1587.

CXA1587

Item No	Adjustment item	Data Amount
01	PICTURE	53
02	COLOR	31
03	BRIGHT	31
04	HUE	31
05	SHARPNESS	12
06	RGB PICTURE	7
07	SUB CONTRAST	ADJ.
08	SUB COLOR	ADJ.
09	SUB BRIGHT	ADJ.
10	SUB HUE	8
11	VM LEVEL	2
12	NR LEVEL	0
13	ABL MODE	0
14	G-DRIVE	ADJ.
15	B-DRIVE	ADJ.

8. Press [OK] button to get the next selection menu.
9. Press ▼ button and move > to the adjustment item and press [OK] button.
10. Press ▲ and ▼ buttons to change the data in order to comply with each standard.
11. Press [OK] button to write data.
12. Turn off the power to quit service mode when adjustments are completed.

CXA1587

Item No	Adjustment item.	Data Amount
01	PICTURE	53
02	COLOR	31
03	BRIGHT	31
04	HUE	31
05	SHARPNESS	12
06	RGB PICTURE	7
07	SUB CONTRAST	ADJ.
08	SUB COLOR	ADJ.
09	SUB BRIGHT	ADJ.
10	SUB HUE	8
11	VM LEVEL	2
12	NR LEVEL	0
13	ABL MODE	0
14	G-DRIVE	ADJ.
15	B-DRIVE	ADJ.
16	G-AUTO CUT OFF	ADJ.
17	B-AUTO CUT OFF	ADJ.
18	R-MANUAL CUT OFF	ADJ.
19	G-MANUAL CUT OFF	ADJ.
20	B-MANUAL CUT OFF	ADJ.
21	GAMMA LEVEL	8
22	DC TRANSFER RATIO	3
23	DYNAMIC PICTURE	2
24	Y FILTER ADJ	ADJ.
25	Y DELAY TIME	15
26	Y DELAY SWITCH 1	0
27	Y DELAY SWITCH 2	1
28	SHARPNESS LIMIT	ON
29	TRAP	OFF
30	H SHIFT	36
31	DA TEST	ON
32	PRE/OVER	12
33	SUB FOCUS	2
34	SUB SHARPNESS	3
35	R MUTE	OFF
36	G MUTE	OFF
37	B MUTE	OFF
38	AGING 1 WHT	OFF
39	AGING 2 BLK	ON
40	AKB OFF	ON
41	INHIBIT RGB	ON
42	FORCED RGB	OFF
43	V/2 V	OFF
44	AXIS	PAL
45	HUE OFF	OFF
46	V EXTENSION	OFF
47	AFC 1	1
48	AFC 2	0
49	AFC	OFF
50	REF. POSITION	0

CXD2018

Item No	Adjustment item.	Data Amount
01	V SIZE	ADJ.
02	V SHIFT	ADJ.
03	S CORRECTION	ADJ.
04	V LINEARITY	ADJ.
05	H SIZE	ADJ.
06	PIN AMP	ADJ.
07	TILT	ADJ.
08	UPPER CORNER	ADJ.
09	LOWER CORNER	ADJ.
10	V BOW	ADJ.
11	ANGLE	ADJ.
12	HV COMP. V	12
13	HV COMP. H	8
14	FRAME SHIFT	OFF
15	FREE RUN 60 Hz	OFF
16	SYSTEM 60 Hz	OFF
17	ASPECT WIDE	OFF
18	DOUBLE SCAN	OFF
19	INTERLACE	ON
20	H SHIFT	26
21	N/S CORRECTION	ADJ.

Typical On Screen Display based values when receiving PAL Phillips pattern.

TDA6612	ADJ
Stereo-Separation	(31)

Should be adjusted twice, once for 4 : 3 and once for 16 : 9 mode.

Y FILTER ADJUSTMENT

1. Input a PAL RED pattern.
2. Connect an oscilloscope to pin ① of CN0403 (R OUT) on C board.
3. Enter into service mode and press 3,8.
4. Adjust data by Δ or ∇ to minimize the chroma element at CN0403 pin ①.

SUB BRIGHTNESS ADJUSTMENT

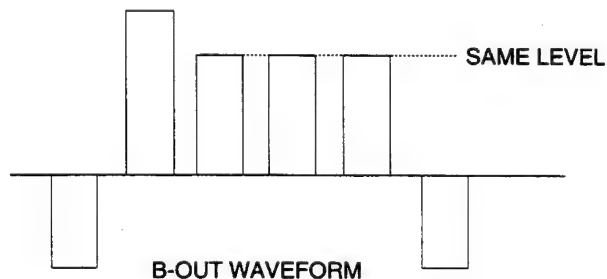
1. Input a Phillips pattern.
2. Enter into service mode and press 23.
3. Adjust data so that 0-IRE of grey scale and CUT-OFF 20-IRE are only slightly visible on screen.

SUB CONTRAST ADJUSTMENT

1. Input a video that contains a small 100% area on a Black Background.
2. Enter into service mode and press 01 to have PIC max followed by 21.
3. Connect oscilloscope to pin ① of CN0403 (R OUT) and adjust data to obtain 2.5Vp-p.

SUB COLOR ADJUSTMENT

1. Input a PAL color bar signal.
2. Connect an oscilloscope to pin ③ of CN0403 (B OUT) on the C board.
3. Enter into service mode and press 22 of CXA1587, 8 SUB COLOR.
4. Adjust data so that the right sides of the waveform are set to the same level.

**STEREO-SEPARATION ADJUSTMENT**

1. Input a 1kHz stereo signal to the L-ch and a 400Hz stereo signal to the R-ch.
2. Enter into service mode and press 19.
3. Adjust data so that sound is not detected in the Right-ch and the Left-ch.

DRIVE AND CUT-OFF

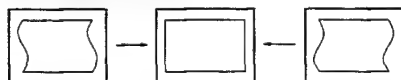
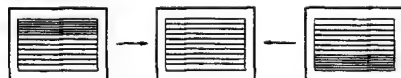
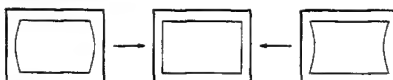
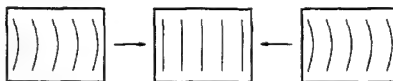
See direct test mode list attached and refer to sub brightness or such for adjustment method.

DEFLECTION SYSTEM ADJUSTMENT

1. Enter into service mode and select CXD2018.
2. Select and adjust each item in order to obtain the optimum image.

CXD2018

Item No	Adjustment item.	Data Amount
01	V SIZE	ADJ.
02	V SHIFT	ADJ.
03	S CORRECTION	ADJ.
04	V LINEARITY	ADJ.
05	H SIZE	ADJ.
06	PIN AMP	ADJ.
07	TILT	ADJ.
08	UPPER CORNER	ADJ.
09	LOWER CORNER	ADJ.
10	V BOW	ADJ.
11	ANGLE	ADJ.
12	HV COMP. V	12
13	HV COMP. H	8
14	FRAME SHIFT	OFF
15	FREE RUN 60 Hz	OFF
16	SYSTEM 60 Hz	OFF
17	ASPECT WIDE	OFF
18	DOUBLE SCAN	OFF
19	NON INTERLACE	ON
20	H SHIFT	26
21	N/S CORRECTION	ADJ.

V SIZE**V SHIFT****S CORRECTION****V LINEARITY****H SIZE****PIN AMP****TILT****UPPER CORNER PIN****LOWER CORNER PIN****V BOW****ANGLE****H SHIFT****N/S CORRECTION**

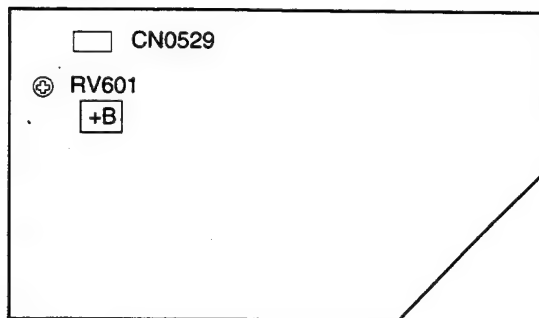
3. Press **OK** button to write data.

If the menu display prevents accurate adjustment, press **ESC** to clear, to resume, press **ESC** once again.

4-2. VOLUME ELECTRICAL ADJUSTMENTS

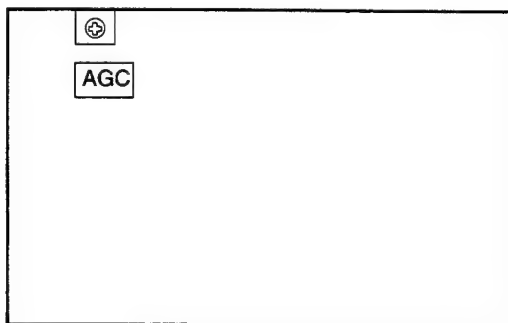
+B (+135V) ADJUSTMENT (RV601)

D BOARD



1. Switch on the power to the TV set.
2. Connect a digital multi-meter to pin ① of CN0529 on D board.
3. Adjust RV601 on D board to $+135V \pm 0.5V$.

AGC ADJUSTMENT (IF BLOCK)



1. Receive an off-air signal.
2. Adjust the AGC VR so that there is no snow noise or cross-modulation visible on the screen.
3. Change the receiving channel and confirm status.

4-3. TEST MODE 2 :

Is available by pressing Test button twice, OSD 'TT' appears. The functions described below are available by pressing the two numbers. To release the Test Mode 2, press 0 twice, or switch the TV into Stand-by Mode.

00	switch Test Mode 2 off
01	picture maximum
02	picture minimum
03	Volume 35%
04	Volume 50%
05	Volume 65%
06	Volume 80%
07	Ageing Condition (Volume min., Picture max., Brightness max., Ageing 2 Mode of CXA1587, TDA2595 is locked to CXA1587 via PIN 34 of μ -Con.)
08	Shipping Condition (Analog Values are RESET due to factory setting, Prog 1 is selected, TT Mode is switched off)
09	dummy
10	Tenth entry is deleted
11	Balance
12	Hue
13	Display of Software Version and TV set configuration
14	Adjustment of N/S Correction
15	Read factory setting from NVM Reads Volume, Balance, Treble, Bass, Brightness, Contrast, Hue, Sharpness, Colour values from ROM to the actual used values (Last Power Memory)
16	Save actual used values as RESET values Memorize actual used values Balance, Treble, Bass, Hue, Sharpness at RESET position in NVM.
17	Preset Level for AV Sources
18	dummy
19	Stereo Separation
20	Tenth entry is deleted
21	Sub Contrast
22	Sub Colour
23	Sub Brightness
24-29	dummy

30	Tenth entry is deleted
31	Green Drive
32	Blue Drive
33	Green Cut Off (Auto Cut Off)
34	Blue Cut Off (Auto Cut Off)
35	Red Cut Off (Manual Cut Off) (Auto Cut Off is switched off)
36	Green Cut Off (Manual Cut Off) (Auto Cut Off is switched off)
37	Blue Cut Off (Manual Cut Off) (Auto Cut Off is switched off)
38	Y-Filter adjustment (Trap is switched off and TDA9145 is switched in forced NTSC Mode)
39	dummy
40	Tenth entry is deleted
41	Default setting of CXA1587 (Only available in Prog 99)
42	Default setting of CXA2018 (Only available in Prog 99)
43	Default setting of CXA1526 (Only available in Prog 99)
44	(all Port High) Not yet
45	(all Port High) Not yet
46	IR Channel Presetting Mode The channel presetting can be done by a Special IR Transmitter
47-48	dummy
49	Erase the NVM Testbyte (this byte detects already stored NVM's) After selecting this function, switch TV Off and On -> the NVM will be preset by μ -Controller. (Not the channel data)

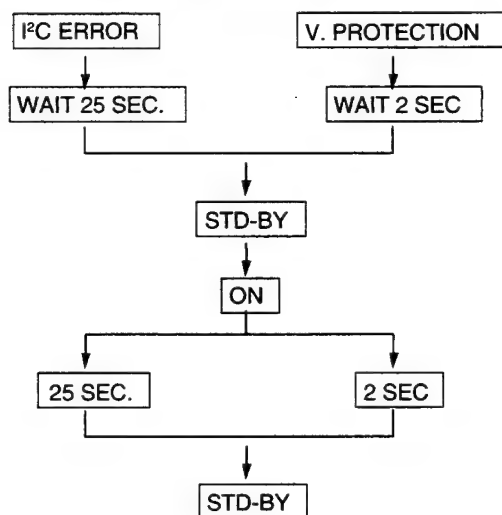
Note: For No 35, 36, 37 and 38 special pressing (AKB, forced Color Mode, Trap) is selected. After selecting a new Test Mode Number, the AKB is switched ON, the Trap is switched ON and TDA9145 is switched to Auto Search Mode.

In Test Mode 2 the Menu display is switchable by the Speaker-Off button.

4-4. ERROR MESSAGE

Self diagnostic system operates as follows.

- When the microprocessor is unable to receive an acknowledgement back from the device, the LED starts flashing according to the table below.



In the case of more than one error in parallel, the blinking error shows max priority according to the error number (e.g. error 2 and error 5 appear together, then LED,s show error 2).

ERROR TABLE

ERROR COUNT	IC TYPE	FUNCTION
1	I ² C BUS	SDA low
2	X24C16	EPROM
4	TDA9145	Colour decoder
5	CXA1587	RGB/Jungle
6	TDA6612	Sound processor
7	CXD2018	V deflection
8	CXA1545	AV switch
11	SDA5248	Text
13		V protection

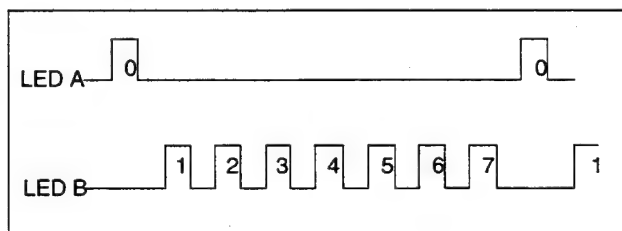
Stand By LED blinking

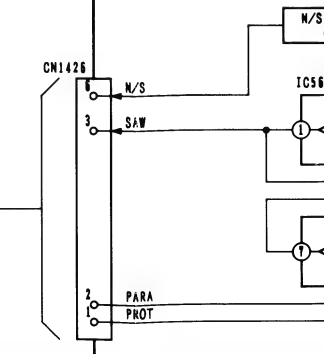
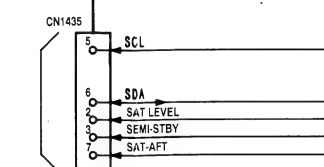
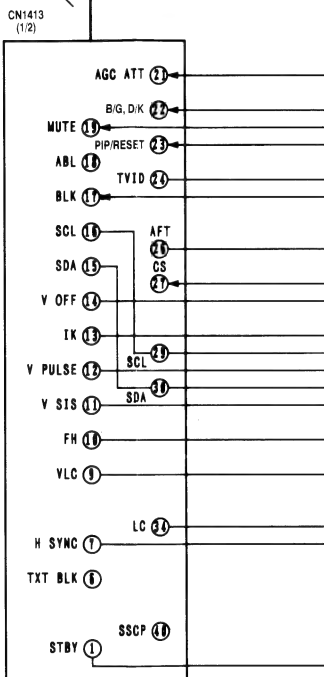
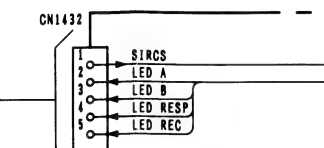
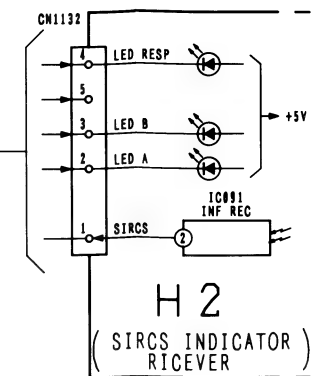
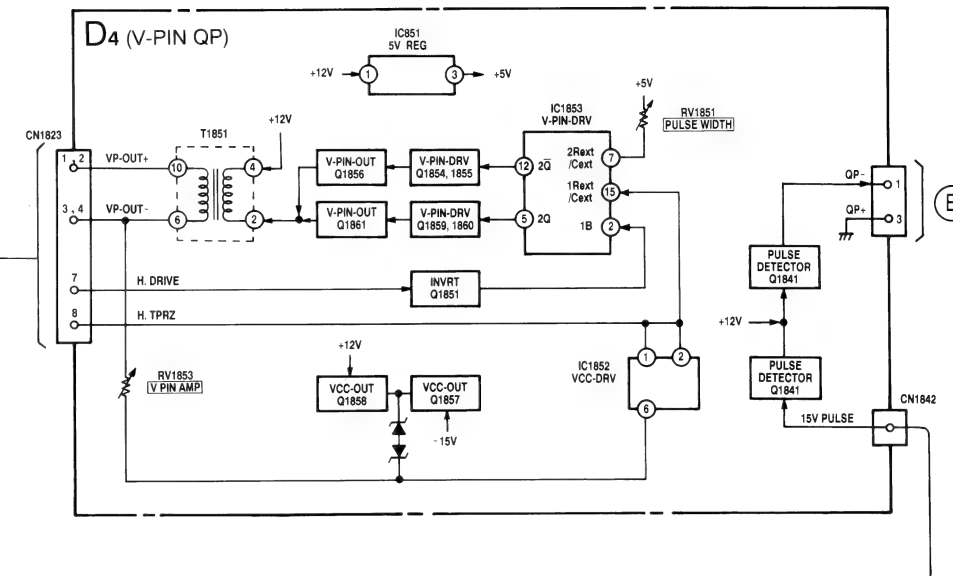
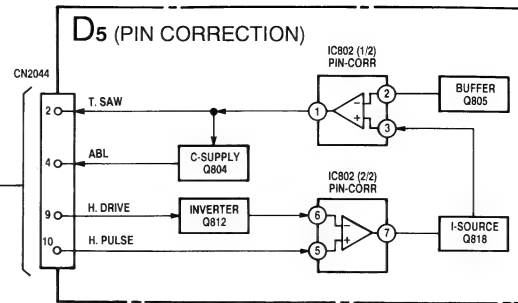
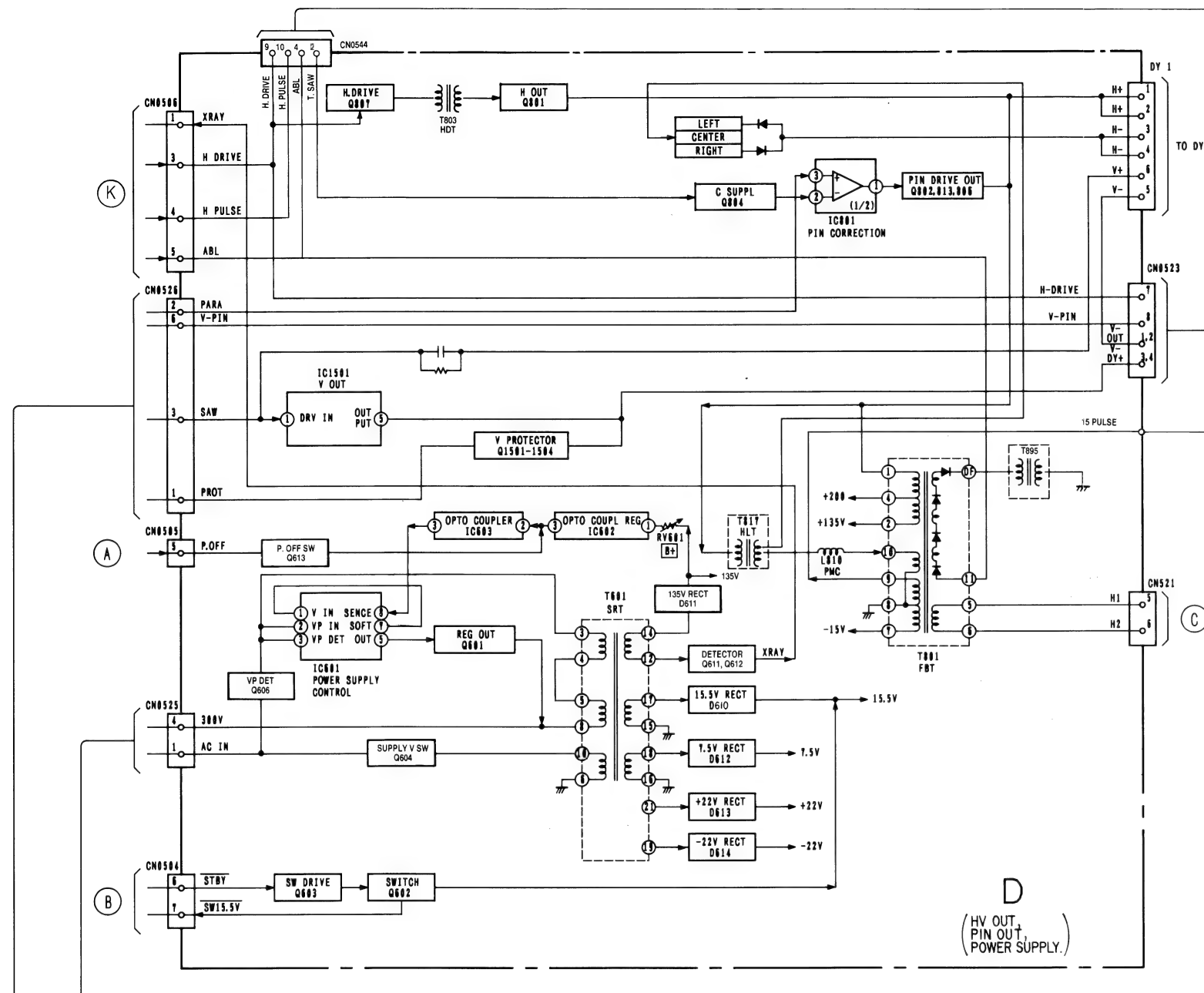
No 1K return

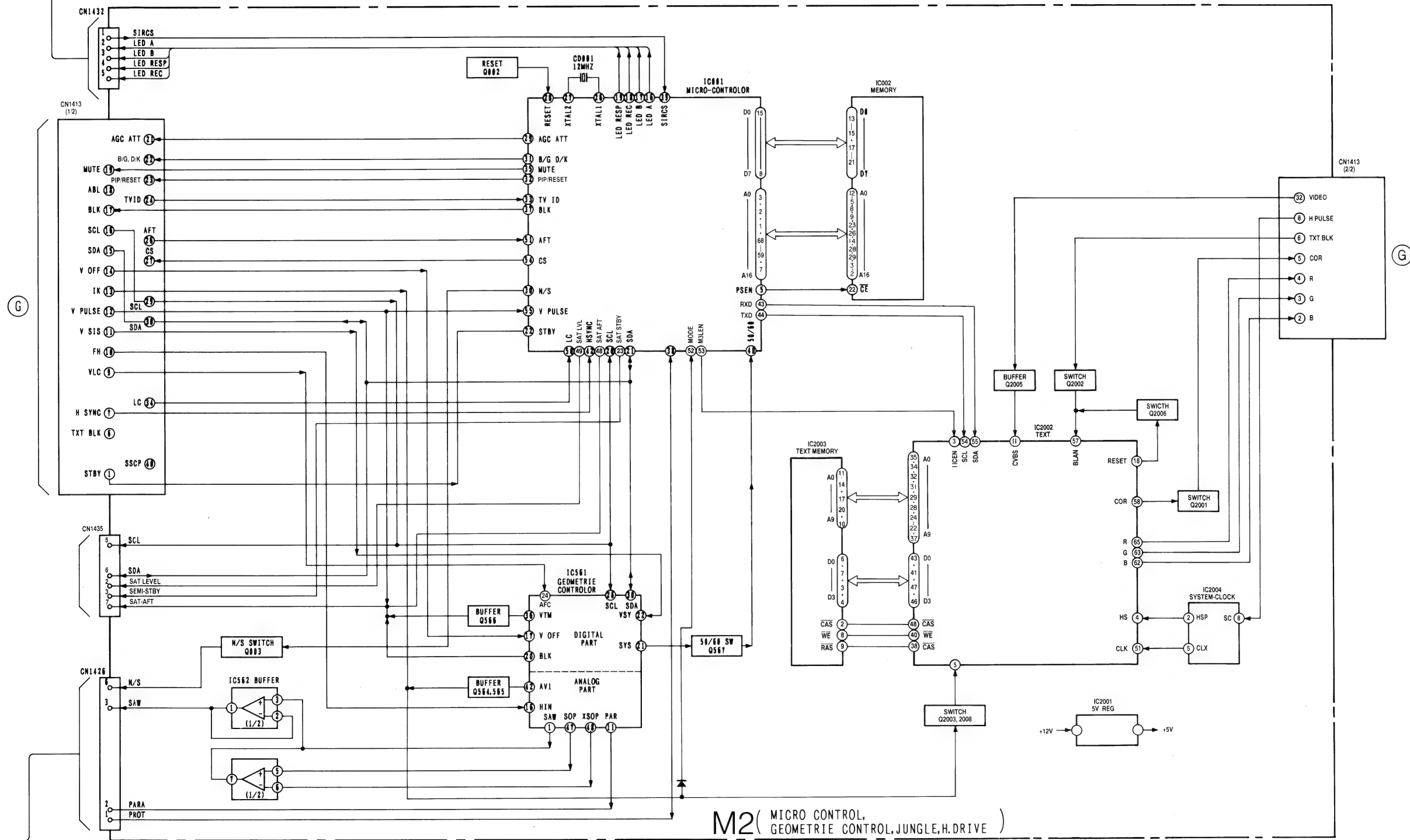
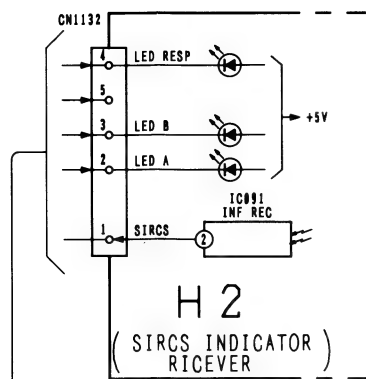
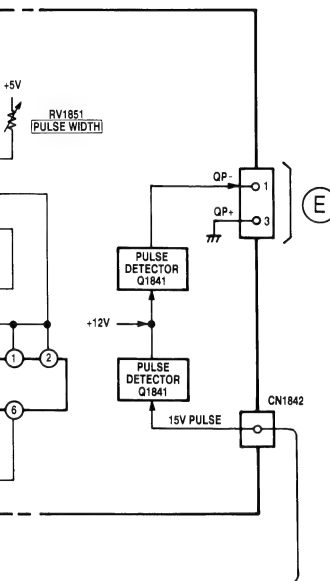
4-5. ERROR I²C BUS DIAGNOSTIC SYSTEM FOR AE2-B CHASSIS.

For all IC's used in the AE 2-B chassis which are necessary to obtain picture and sound there is an inbuilt I²C Bus diagnostic system.

In the case of no acknowledge bit, LED A and LED B start blinking as shown.

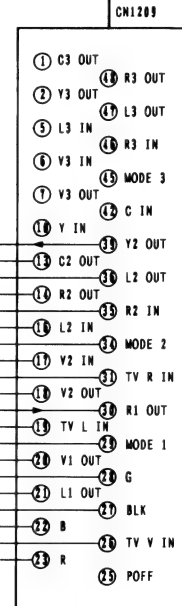
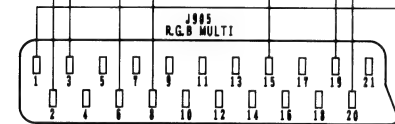
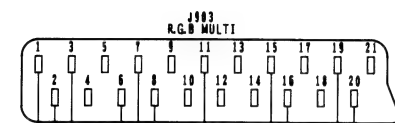
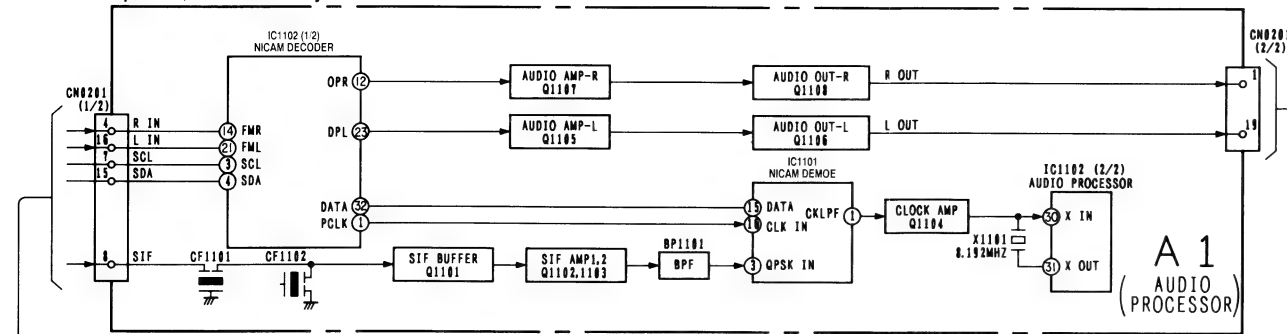




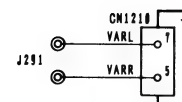


BLOCK DIAGRAM (2)

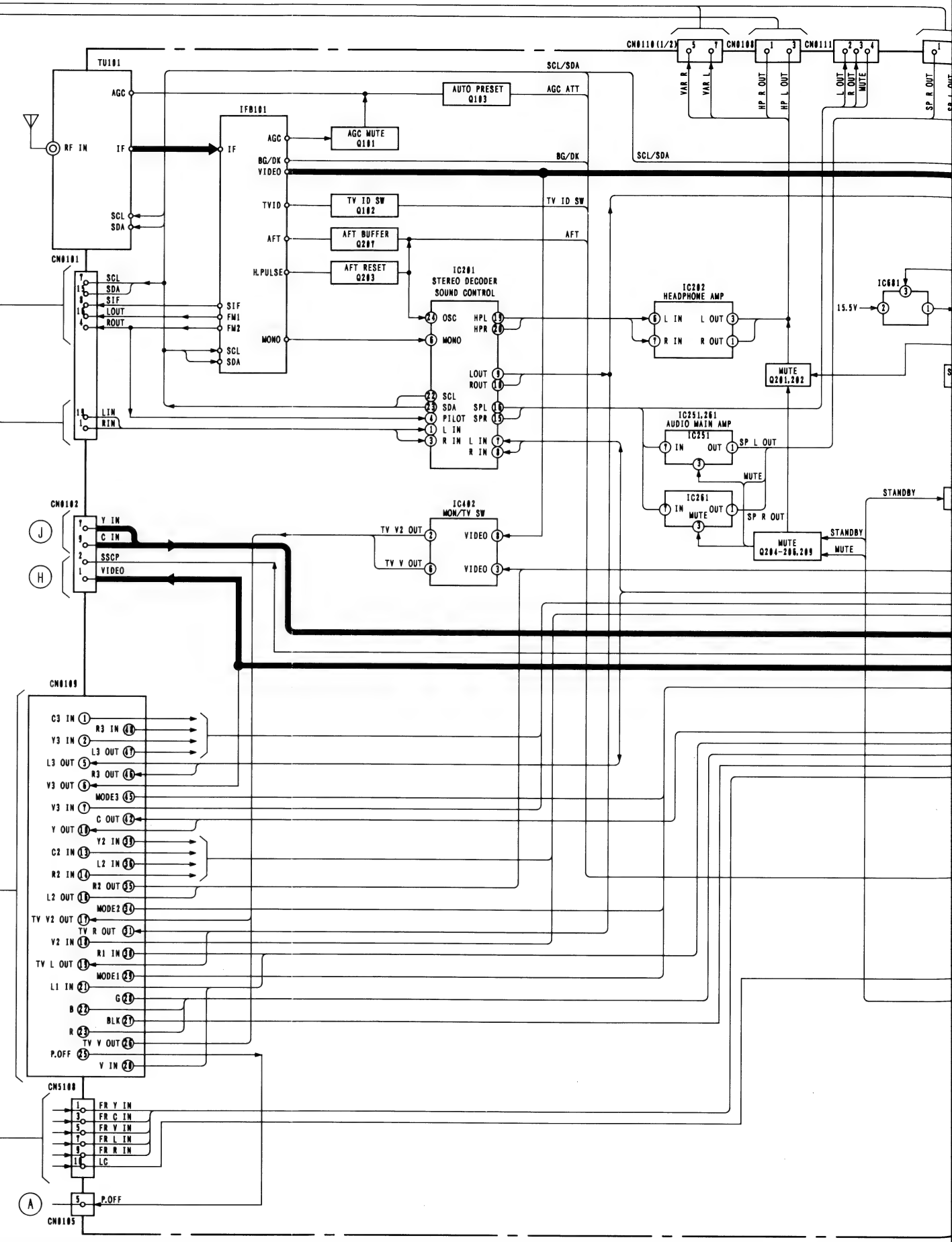
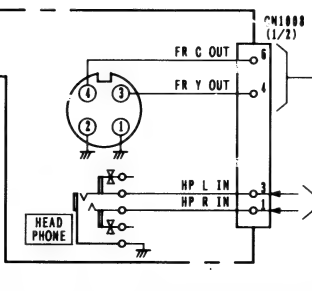
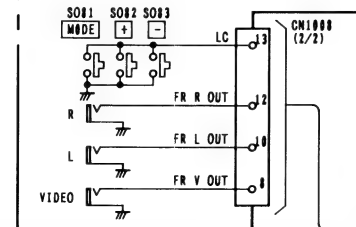
Spanish, UK model only

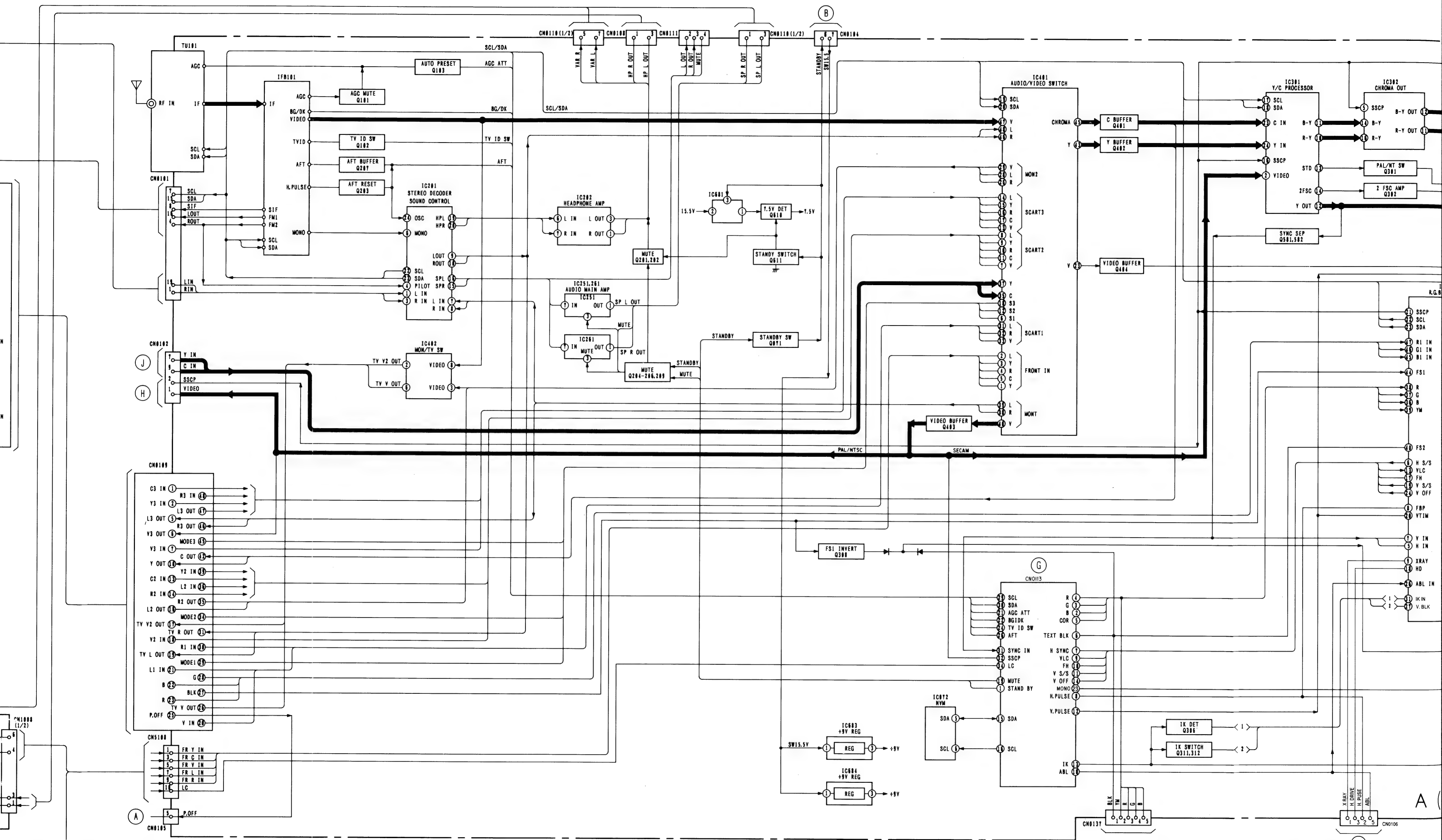


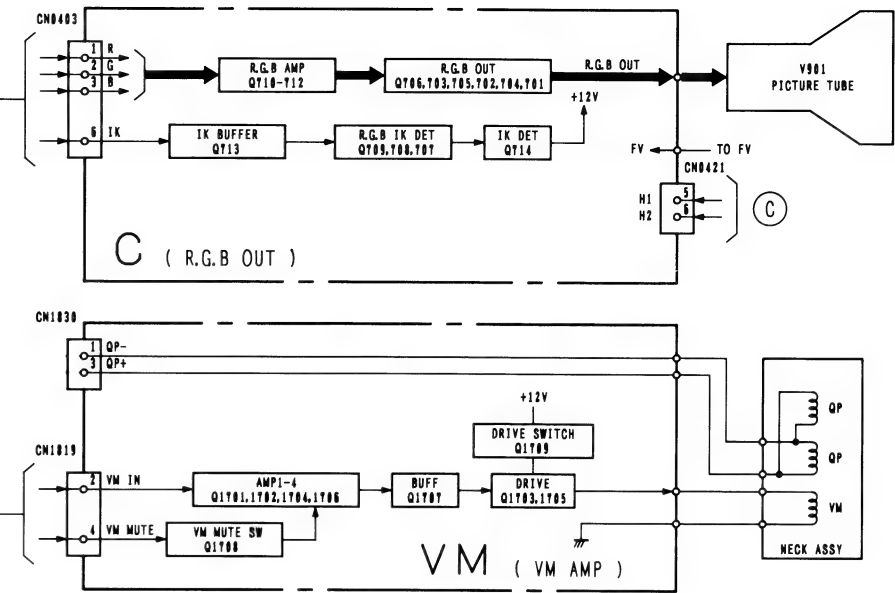
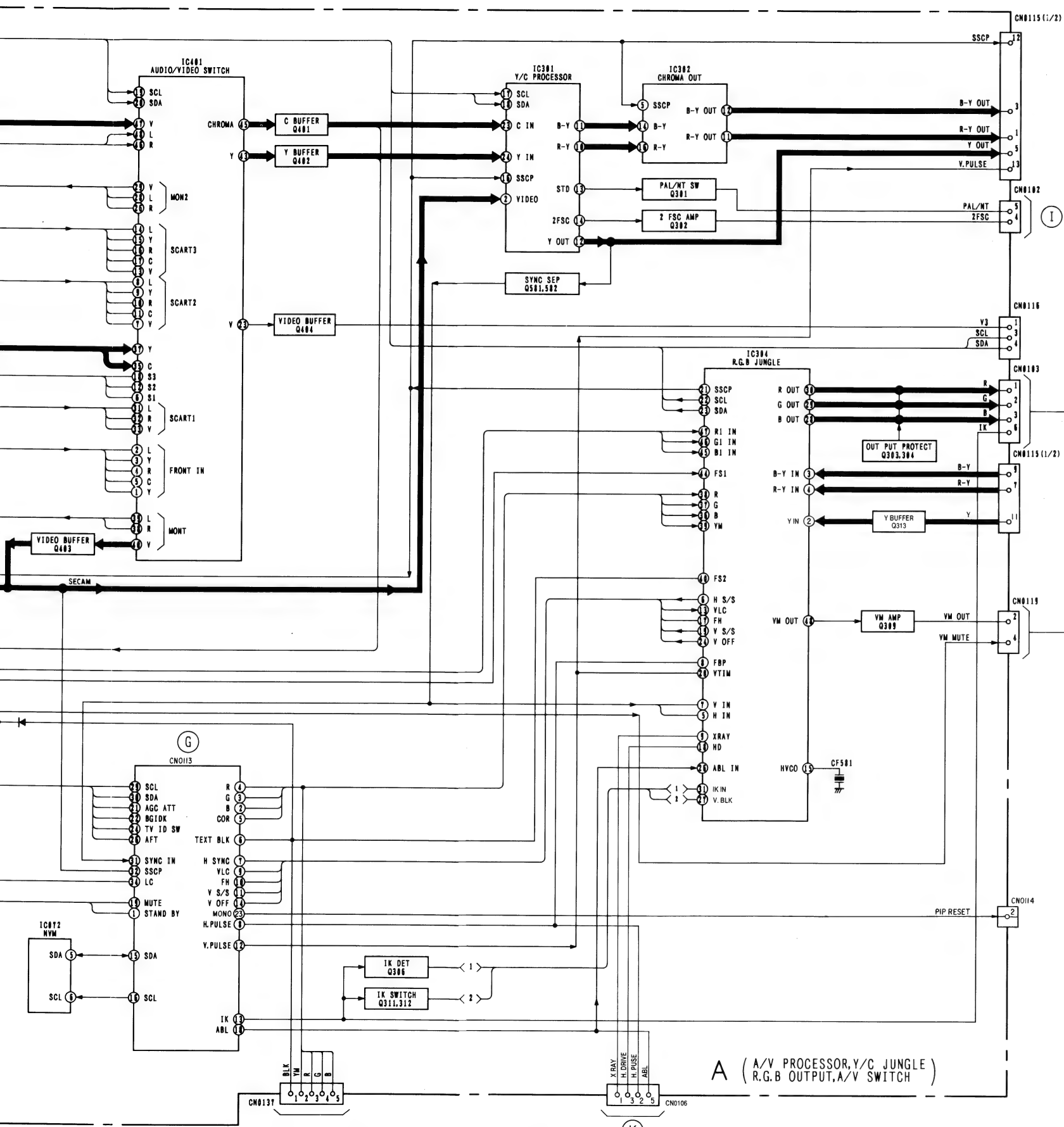
J (AUDIO/VIDEO I/O, RGB OUT)



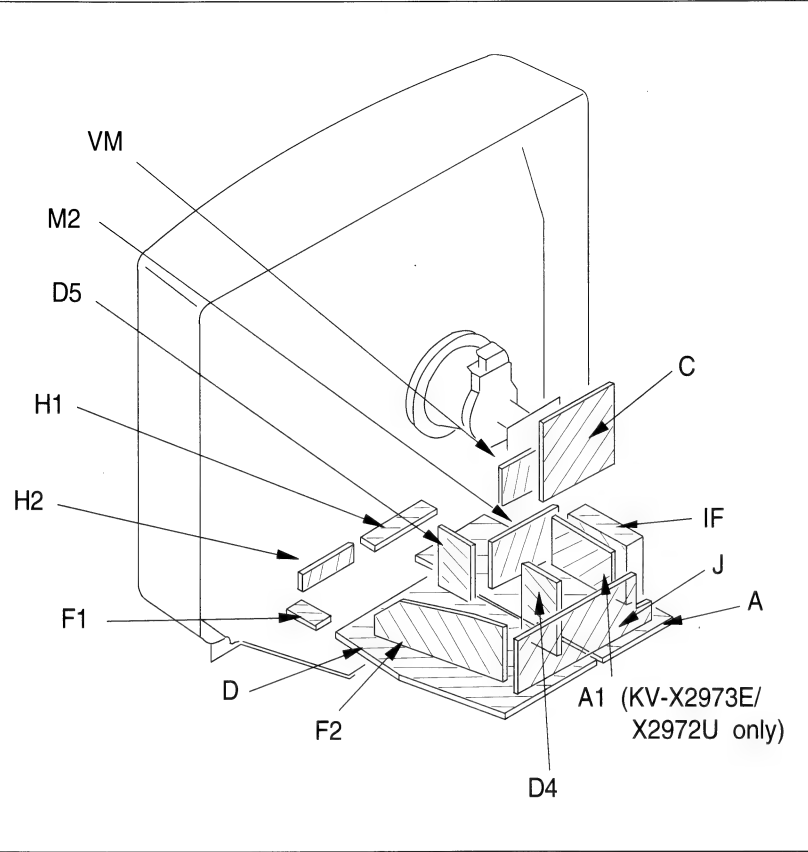
H 1 (Y/C OUT, VIDEO OUT, AUDIO I/O, A/V SWITCH)







5-2. CIRCUIT BOARDS LOCATION



Reference information

RESISTOR	RN	: METAL FILM
	RC	: SOLID
	FPRD	: NONFLAMMABLE CARBON
	FUSE	: NONFLAMMABLE FUSIBLE
	RS	: NONFLAMMABLE METAL OXIDE
	RB	: NONFLAMMABLE CEMENT
	RW	: NONFLAMMABLE WIREWOUND
	※	: ADJUSTMENT RESISTOR
COIL	LF-8L	: MICRO INDUCTOR
CAPACITOR	TA	: TANTALUM
	PS	: STYROL
	PP	: POLYPROPYLENE
	PT	: MYLAR
	MPS	: METALIZED POLYESTER
	MPP	: METALIZED POLYPROPYLENE
	ALB	: BIPOLAR
	ALT	: HIGH TEMPERATURE
	ALR	: HIGH RIPPLE

Note: The components identified by shading and mark are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et par une marque sont d'une importance critique pour la sécurité. Ne les remplacer que par des pièces de numéro spécifié.

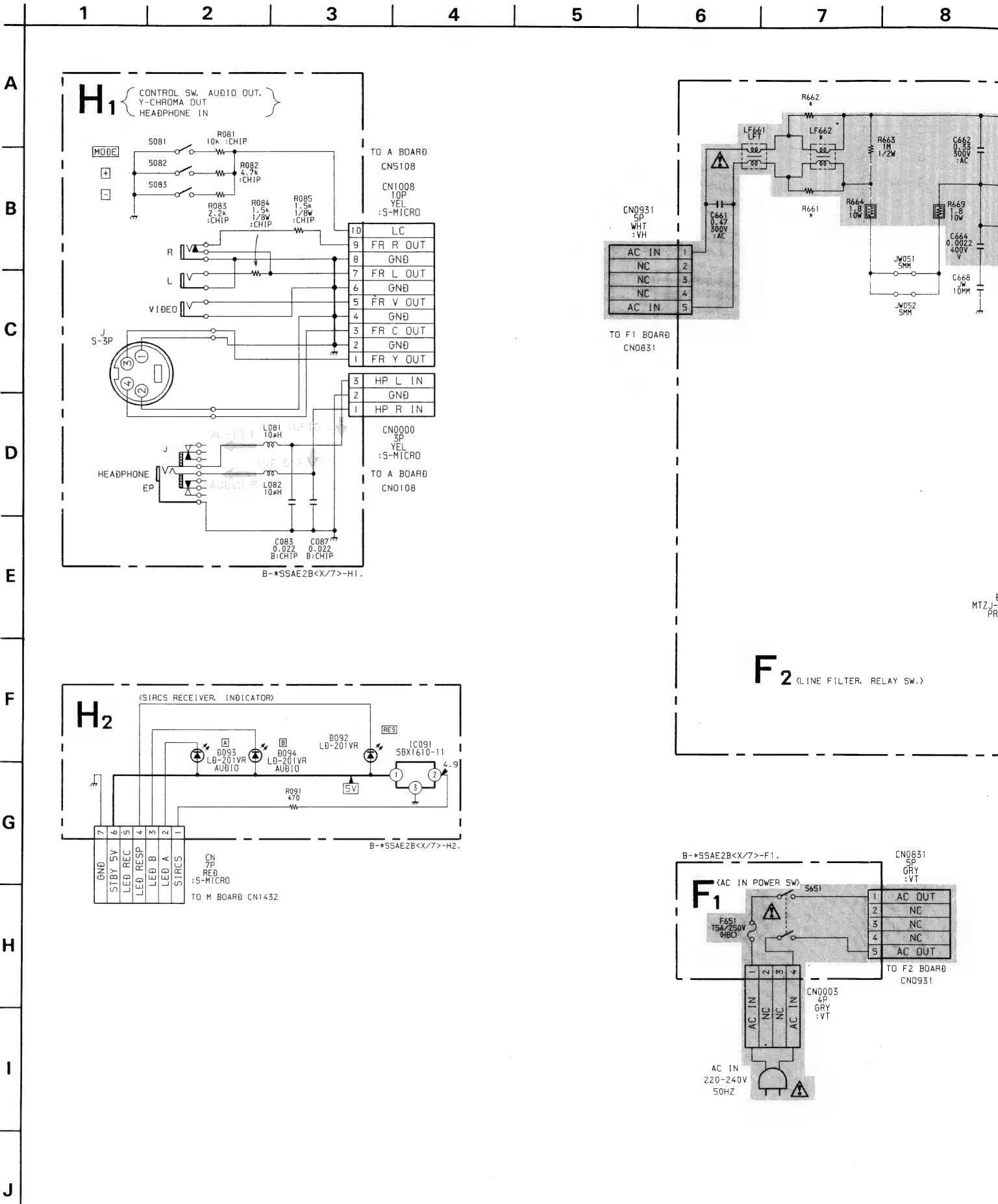
5-3. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

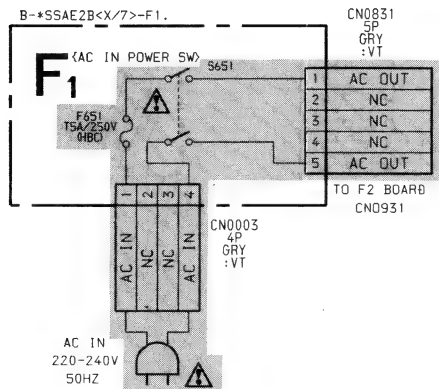
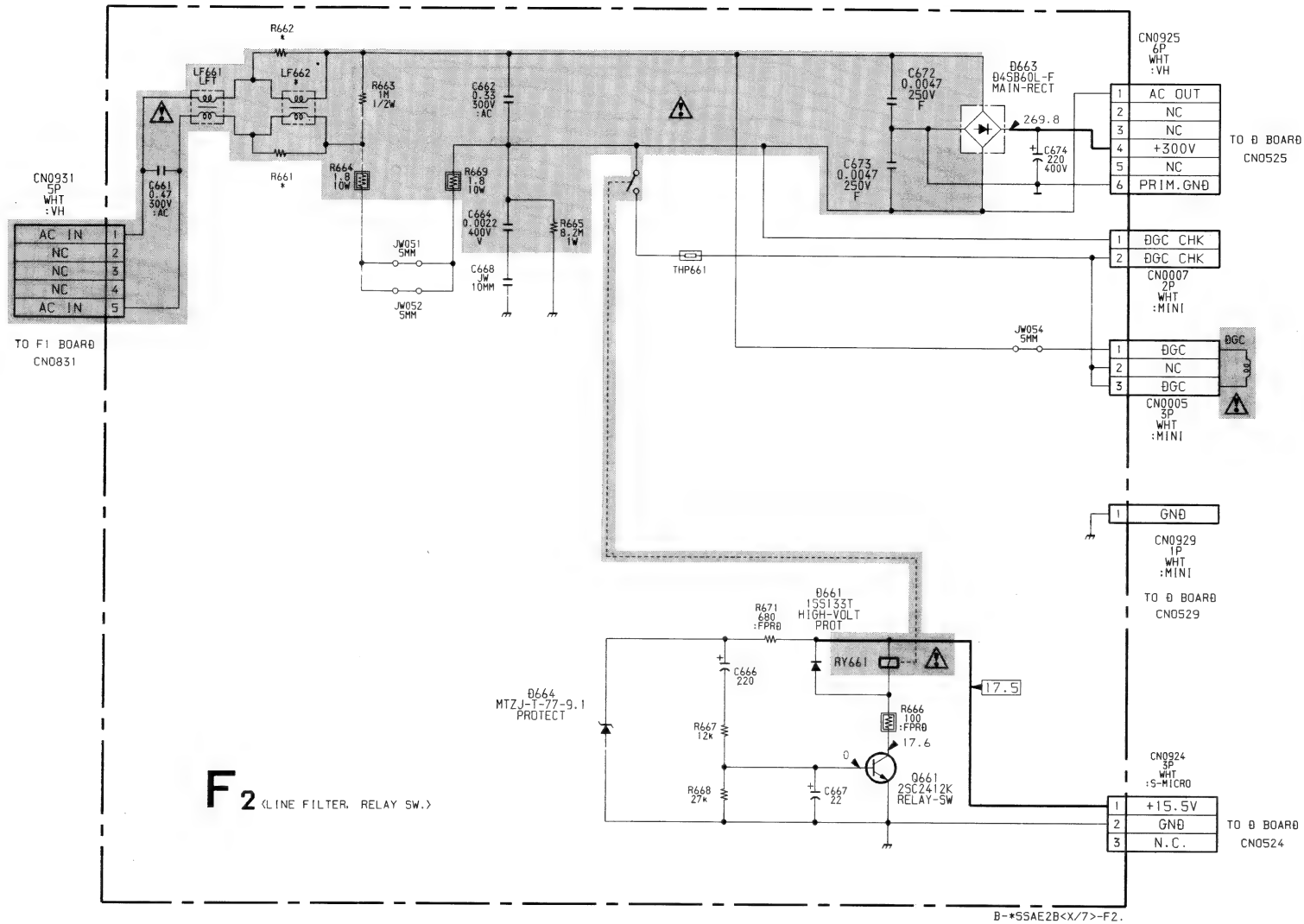
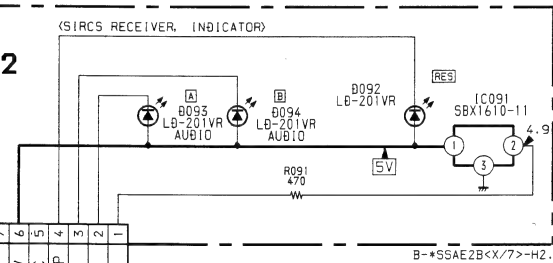
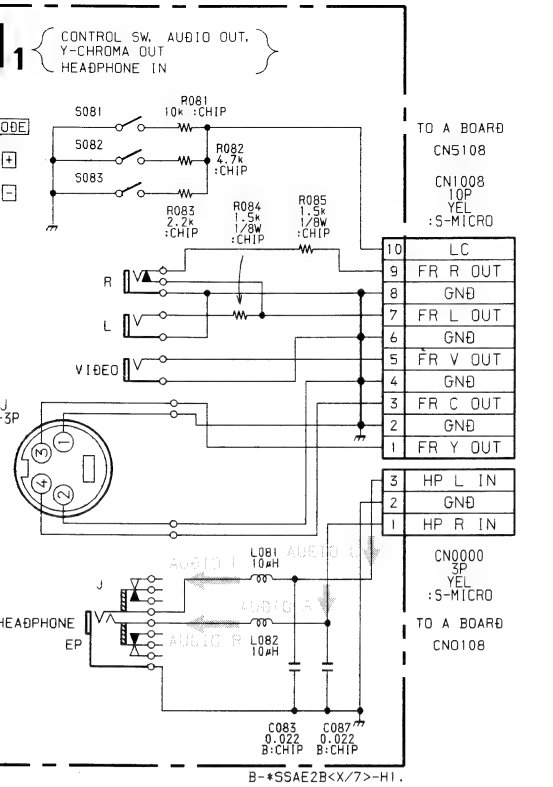
Note :

- All capacitors are in μF unless otherwise noted.
pF : $\mu \mu F$ 50WV or less are not indicated except for electrolytic.
- Indication of resistance, which dose not have one for rating electrical power, is as follows.

Pitch : 5mm
Rating electrical power : 1/4W

- Chip resistor is in 1/10W.
- All resistors are in ohms.
k Ω = 1000 Ω , M Ω = 1000K Ω
- : nonflammable resistor.
- : fusible resistor.
- Δ : internal component.
- : panel designation or adjustment for repair.
- All variable and adjustable resistors have characristic curve B, unless otherwise noted.
- All voltages are in V.
- Readings are taken with a 10M Ω digital multimeter.
- Readings are taken with a color-bar signal input.
- Voltage variations may be noted due to normal produc-tion tolerances.
- : B+ bus.
- : B- bus.
- : signal path.(RF)
- : earth - ground
- : earth - chassis

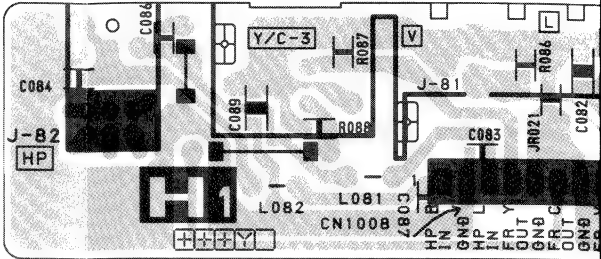




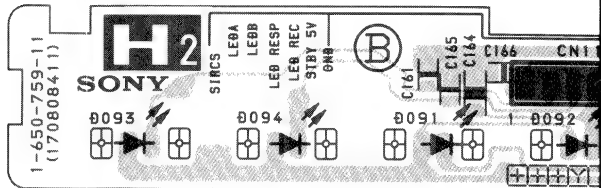
F2 BOARD * MARK

Model	KV-X2971A	KV-X2971B	KV-X2971D	KV-X2971K	KV-X2973E	KV-X2972U
R661	-	JW 10MM	-	-	JW 10MM	JW 10MM
R662	-	JW 10MM	-	-	JW 10MM	JW 10MM
LF662	LFT	-	LFT	LFT	-	-

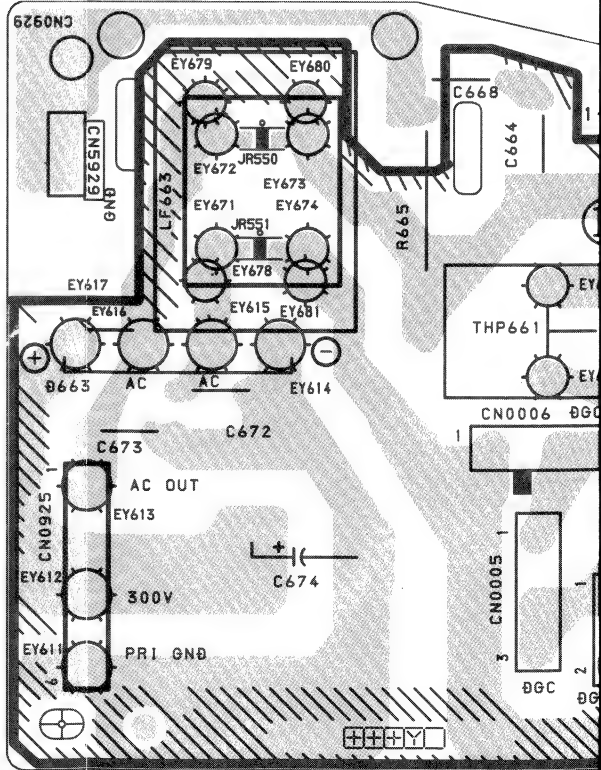
- H1 BOARD -

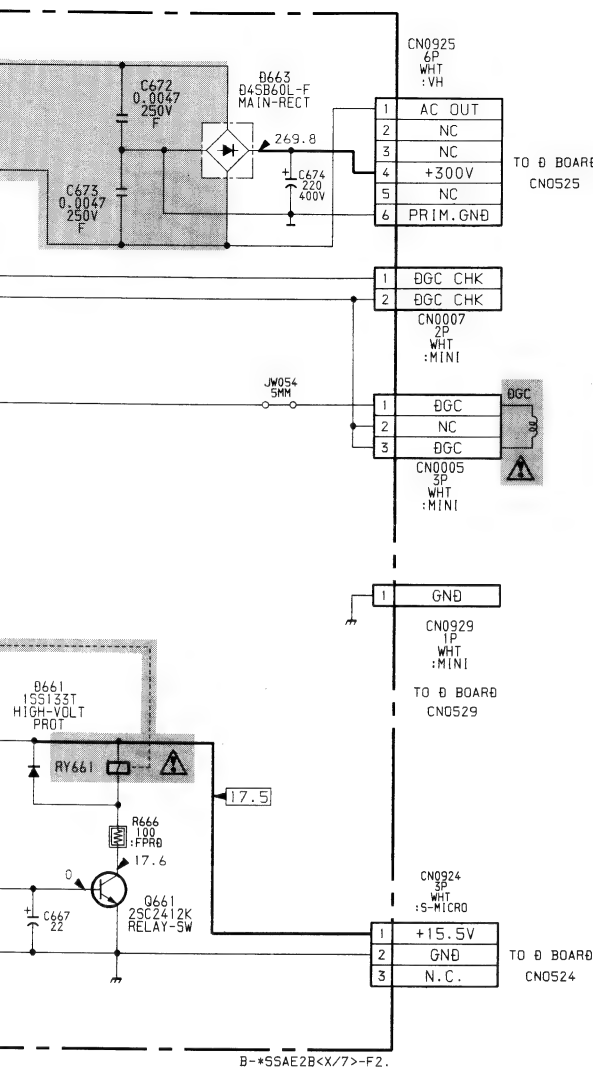


- H2 BOARD -



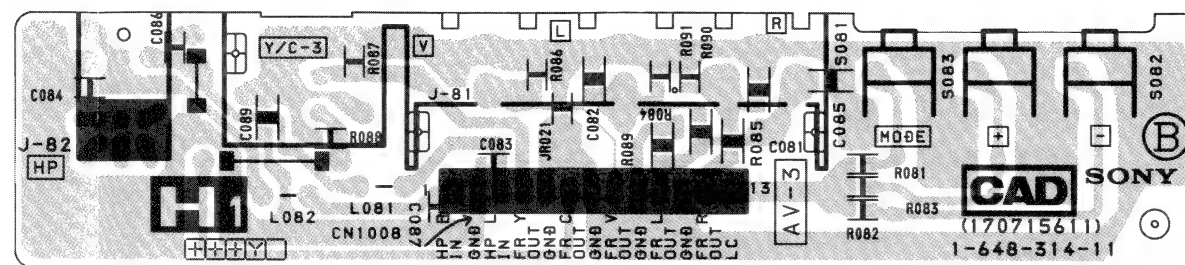
- F2 BOARD -



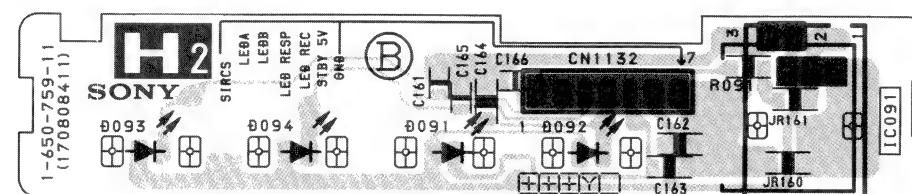


KV-X2971B	KV-X2971D	KV-X2971K	KV-X2973E	KV-X2972U
JW 10MM	-	-	JW 10MM	JW 10MM
JW 10MM	-	-	JW 10MM	JW 10MM
-	LFT	LFT	-	-

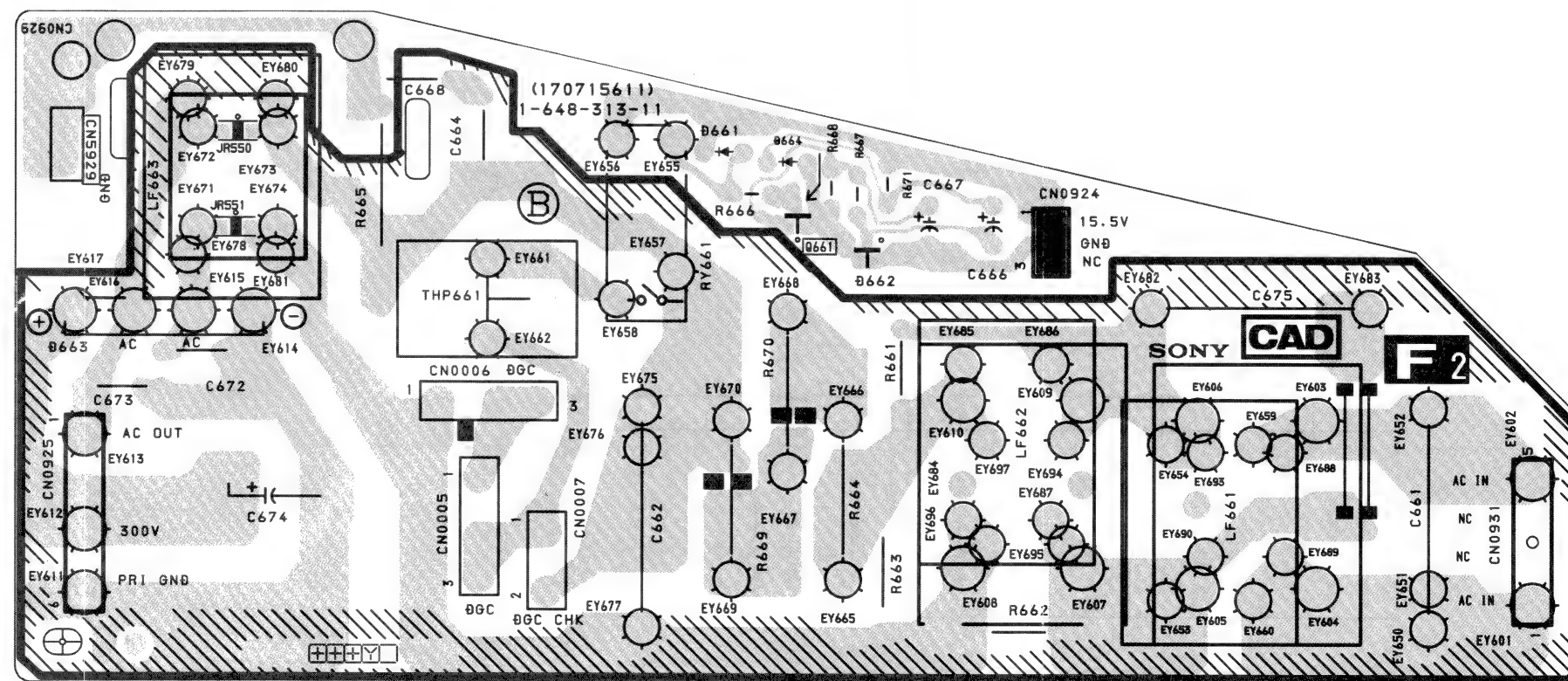
— H1 BOARD —



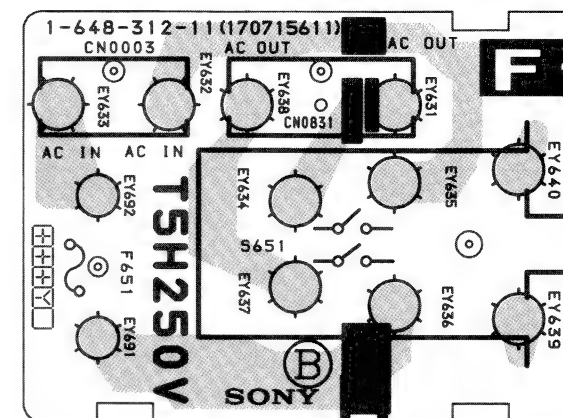
– H2 BOARD –

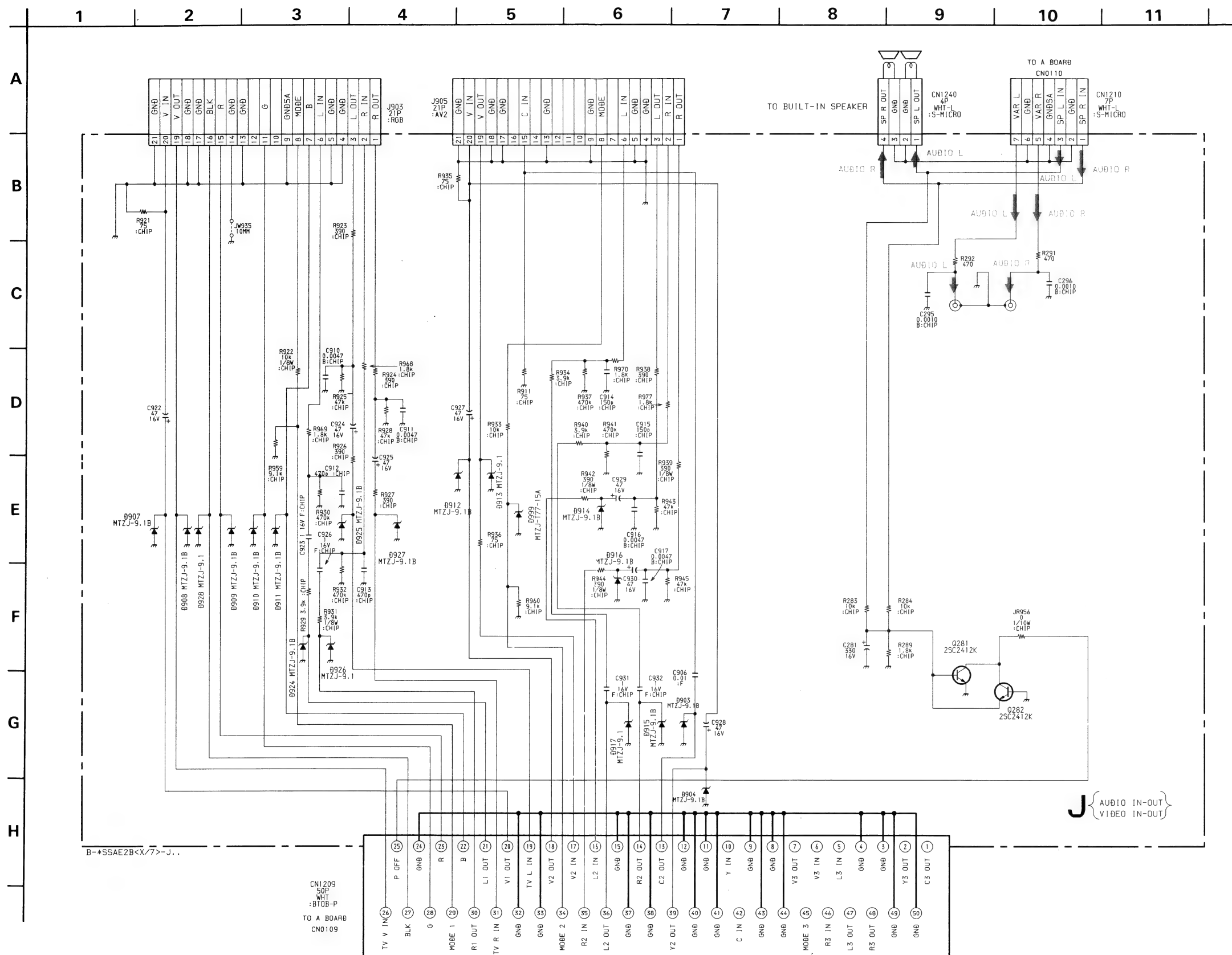


– F2 BOARD –





– F1 BOARD –

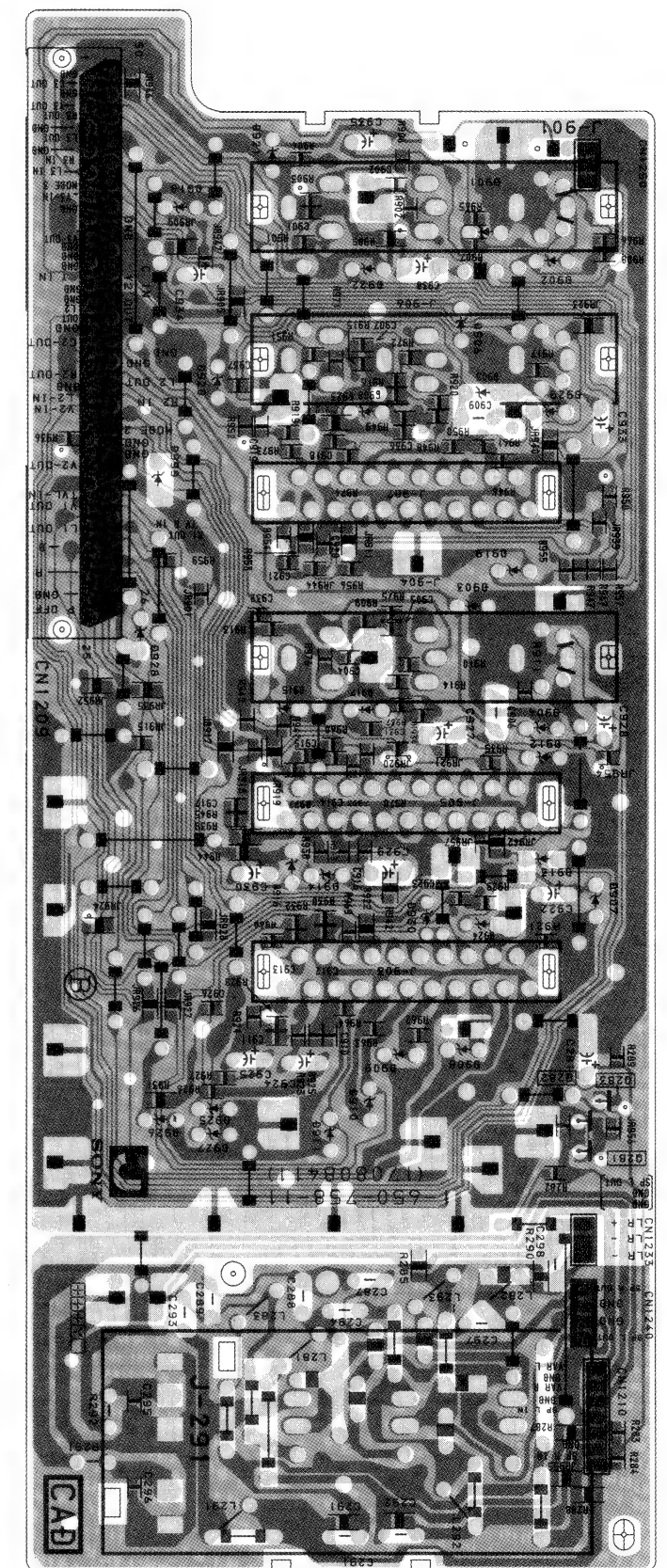


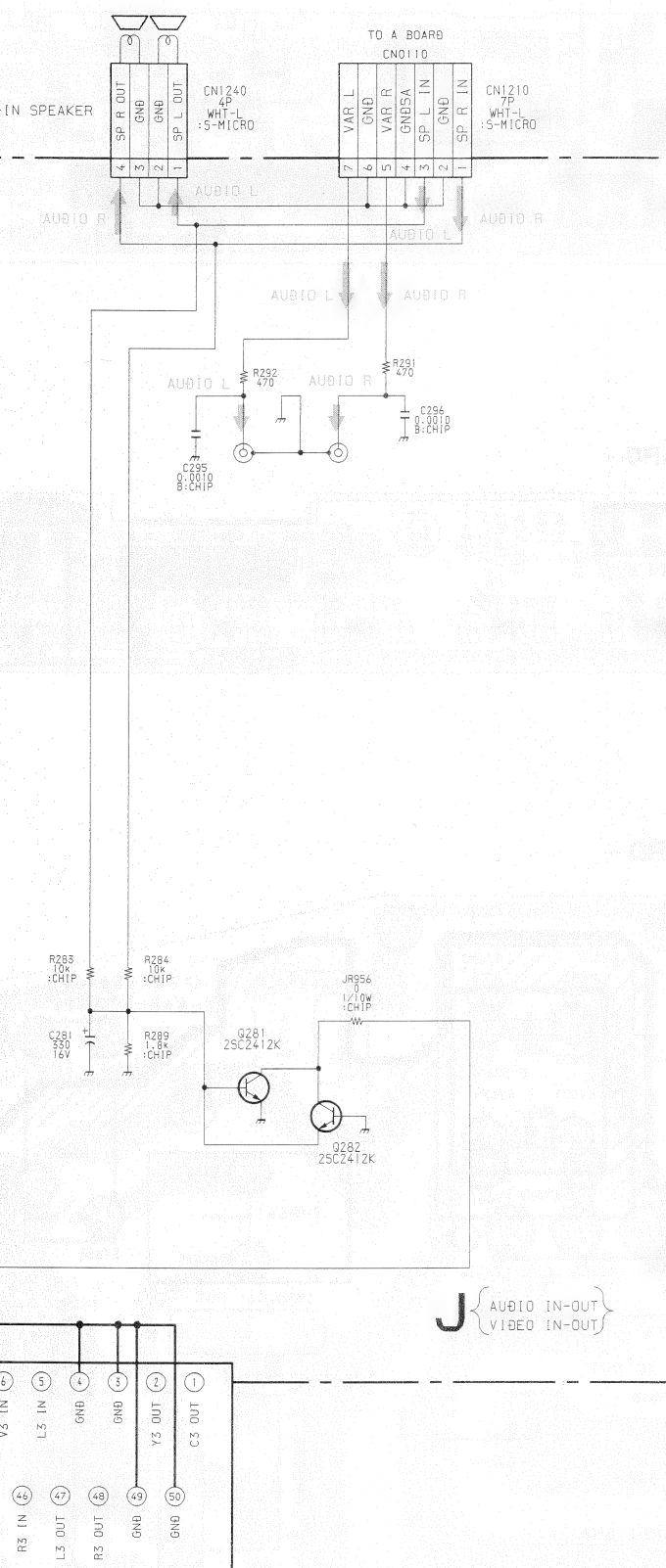


Note :



-  : Pattern from the side which enables seeing.
-  : Pattern of the rear side.

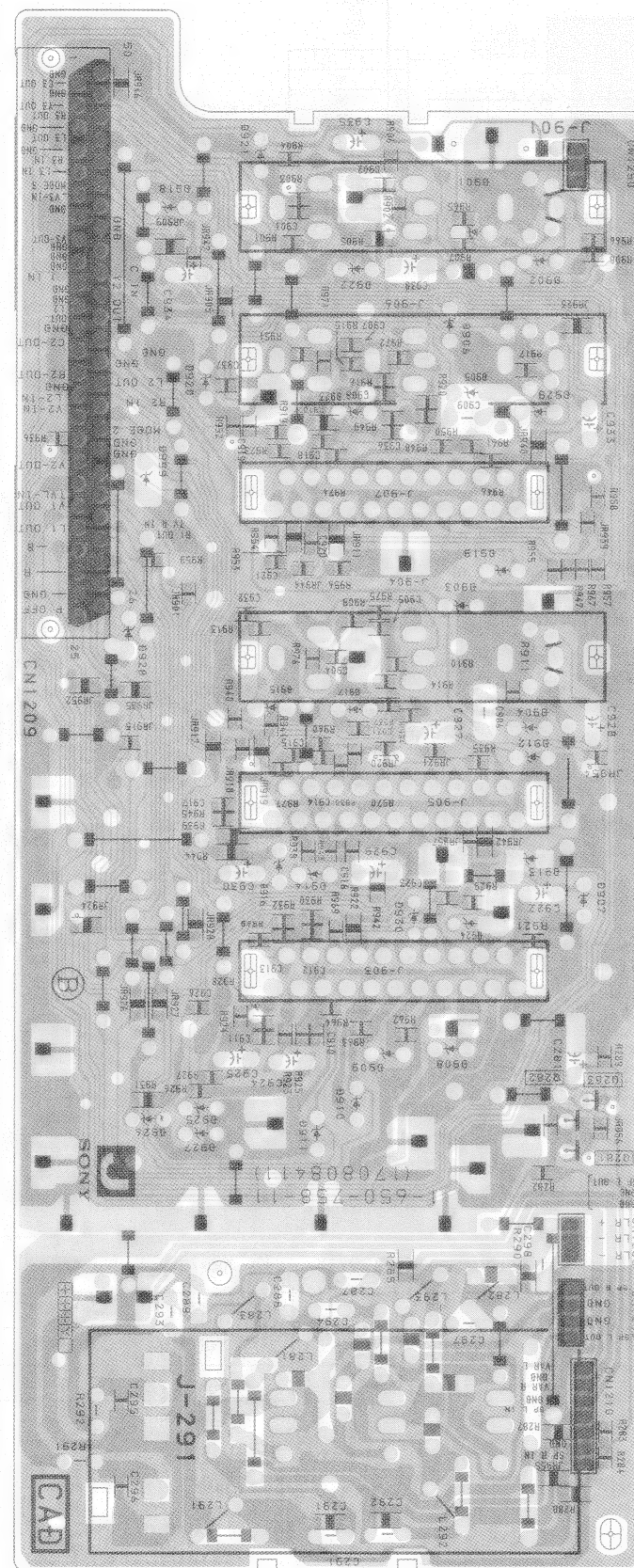
– J BOARD –



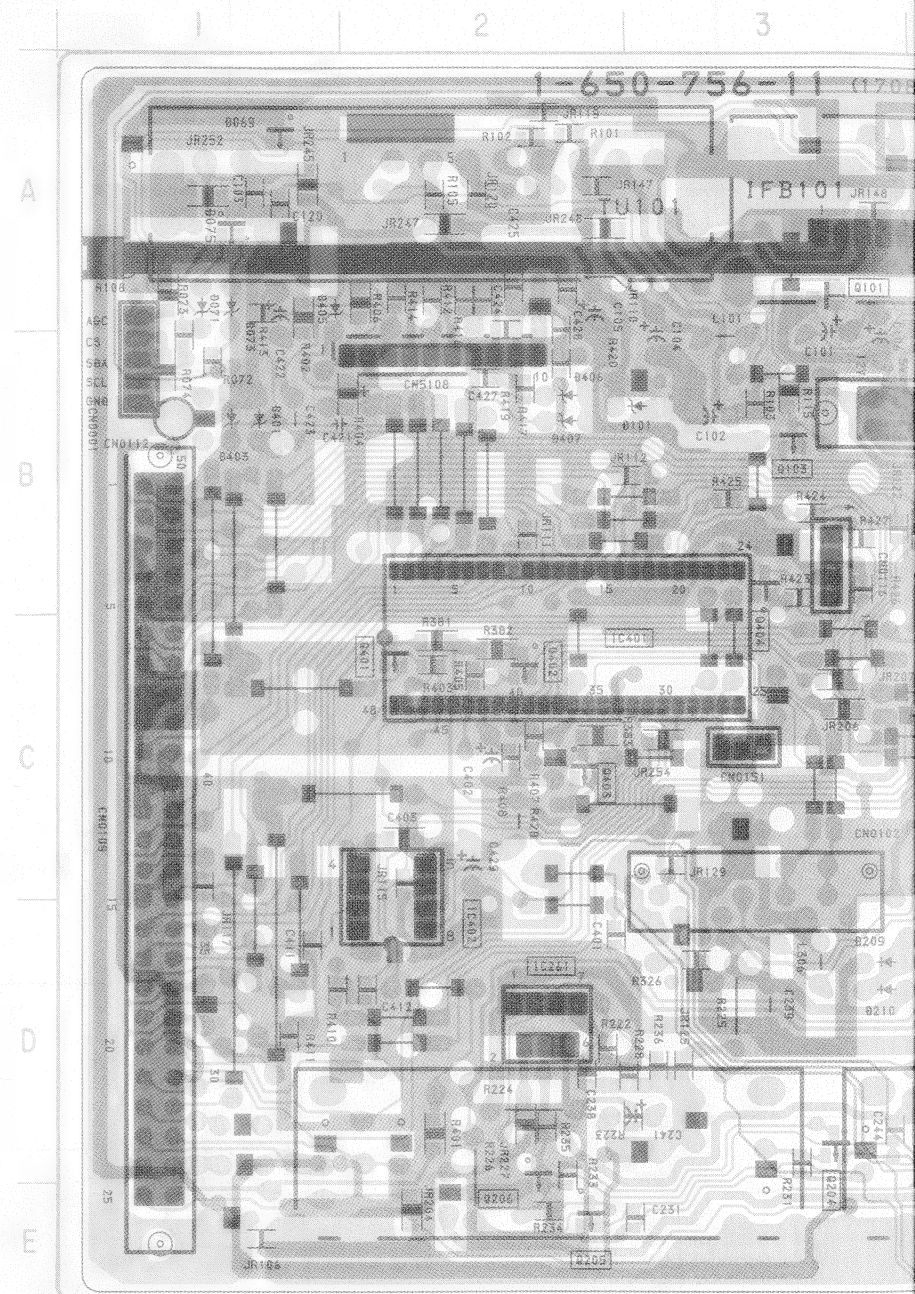


Note :

-  : Pattern from the side which enables seeing.
-  : Pattern of the rear side.



IC		Q404	B - 3
IC072	B - 6	Q581	B - 9
IC201	C - 6	Q582	B - 9
IC202	C - 4	Q610	E - 9
IC251	D - 4	Q681	E - 7
IC261	D - 2	Q682	D - 9
IC301	A - 8		
IC302	A - 10	DIODE	
IC304	C - 10	D068	B - 7
IC401	C - 2	D069	A - 1
IC402	D - 2	D071	A - 1
IC681	D - 9	D073	A - 1
IC684	C - 4	D075	A - 1
IC685	E - 8	D077	B - 7
TRANSISTOR		D078	B - 7
Q071	D - 8	D079	B - 7
Q101	A - 3	D101	B - 2
Q102	A - 7	D206	D - 7
Q103	A - 3	D207	E - 7
Q201	D - 5	D208	D - 7
Q202	D - 5	D209	D - 3
Q203	A - 4	D210	D - 3
Q204	D - 3	D211	E - 5
Q205	E - 2	D212	E - 4
Q206	D - 2	D213	D - 5
Q207	B - 6	D214	C - 6
Q209	E - 7	D301	B - 9
Q210	A - 6	D302	A - 9
Q301	A - 7	D304	B - 10
Q302	B - 7	D305	C - 9
Q303	D - 10	D306	D - 10
Q304	D - 10	D307	D - 10
Q305	A - 8	D308	D - 10
Q306	D - 10	D311	C - 9
Q308	C - 9	D312	C - 8
Q309	C - 9	D313	C - 7
Q311	C - 8	D381	C - 8
Q312	C - 8	D401	B - 1
Q313	B - 8	D403	B - 1
Q314	C - 7	D405	A - 1
Q315	D - 7	D406	B - 2
Q401	C - 2	D407	B - 2
Q402	C - 2	D571	B - 9
Q403	C - 2	D681	E - 8
		D683	D - 9

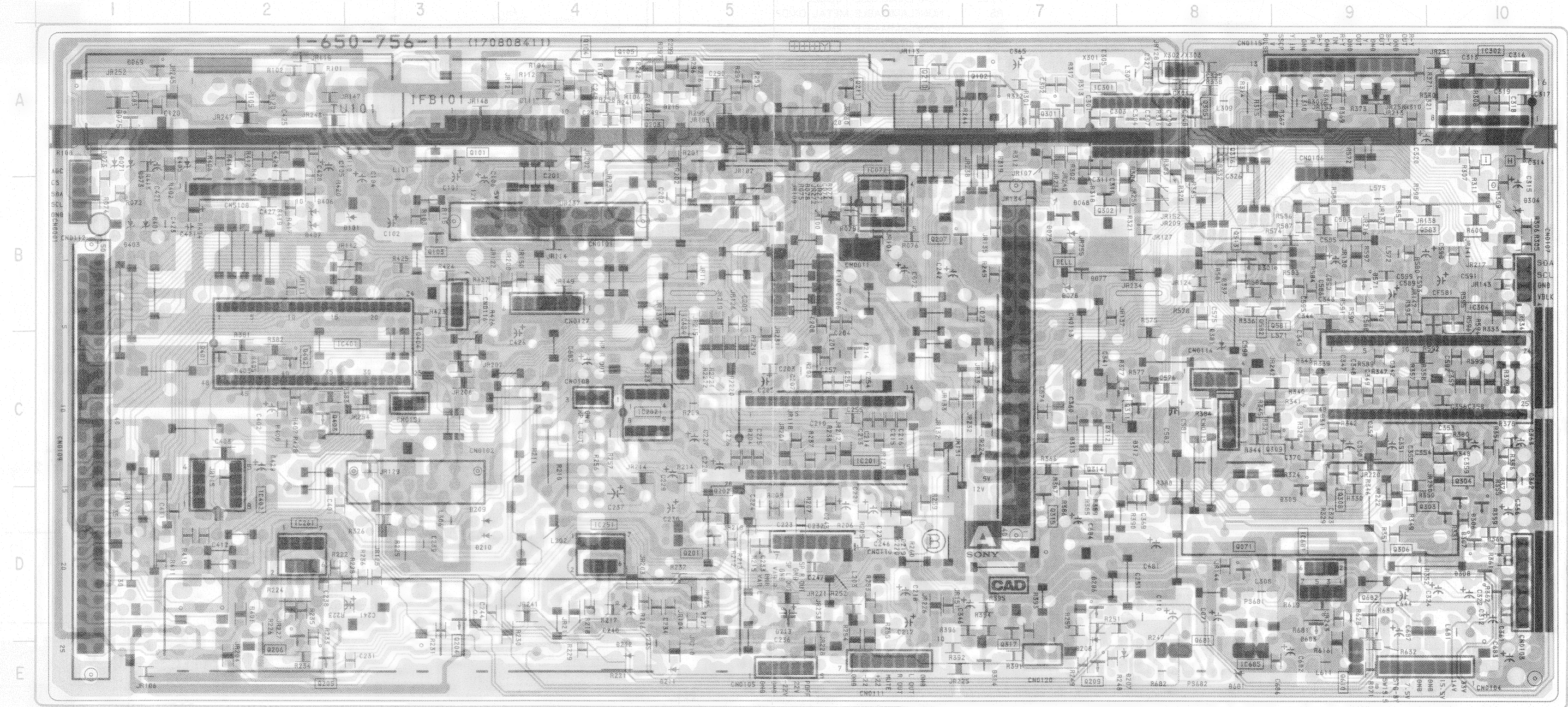


- A BOARD -

04 B-3
01 B-9
02 B-9
0 E-9
01 E-7
02 D-9

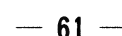
DIODE

08 B-7
09 A-1
1 A-1
3 A-1
5 A-1
7 B-7
8 B-7
9 B-7
1 B-2
6 D-7
7 E-7
8 D-7
9 D-3
0 D-3
1 E-5
2 E-4
3 D-5
4 C-6
1 B-9
2 A-9
4 B-10
5 C-9
6 D-10
7 D-10
8 D-10
1 C-9
2 C-8
3 C-7
1 C-8
1 B-1
3 B-1
5 A-1
6 B-2
7 B-2
1 B-9
1 E-8
3 D-9

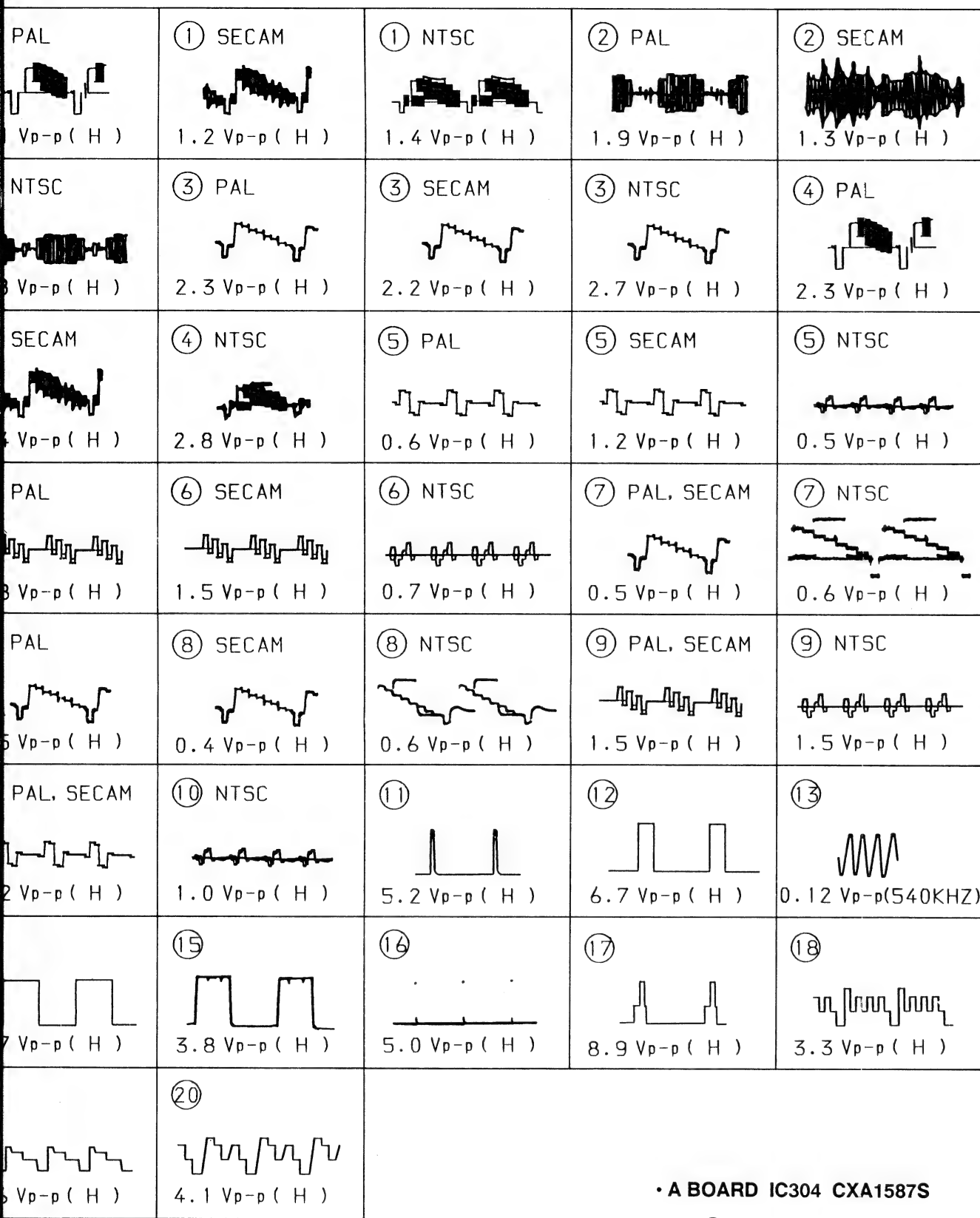


Note :

- Pattern from the side which enables seeing.
- Pattern of the rear side.



VEFORMS A BOARD



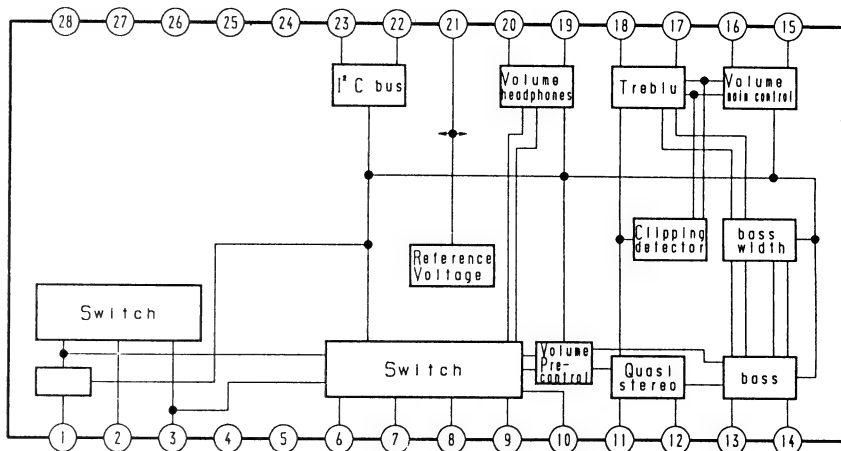
to the voltage value shown by
mark ※ on the Schematic
ram, see the another list.

BOARD

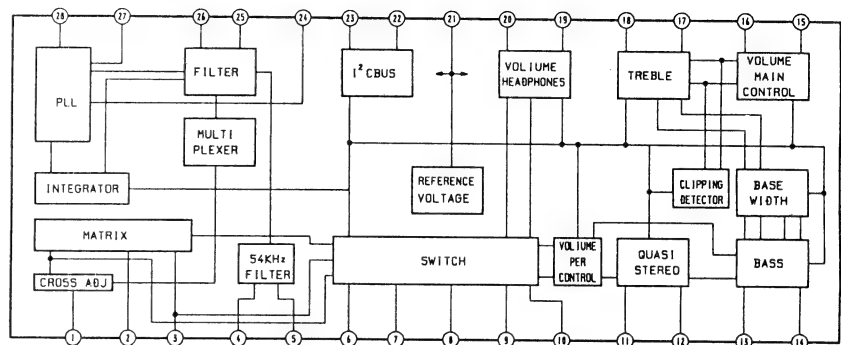
	PAL	SECAM	NTSC3.58	NTSC4.43
⑬	0.0	0.0	4.8	4.9
⑮	0.0	5.0	5.0	0.0
⑰	4.7	4.2	3.6	4.1
⑱	4.3	4.4	4.6	4.8
⑲	0.0	0.0	0.0	1.6
⑳	5.5	5.5	5.5	0.1
㉑	0.0	5.5	5.5	0.0
㉒	0.0	0.0	0.0	1.6

KV-X2971B	KV-X2971D	KV-X2971K	KV-X2973E	KV-X2972U
			20P	20P
TDA6612	TDA6612	TDA6612	TDA6612	TDA6622
IFH-389F	IFH-389	IFH-389	IFH-389	IFH-395
UV916H	UV916H	UV916H	UV916H	U944C

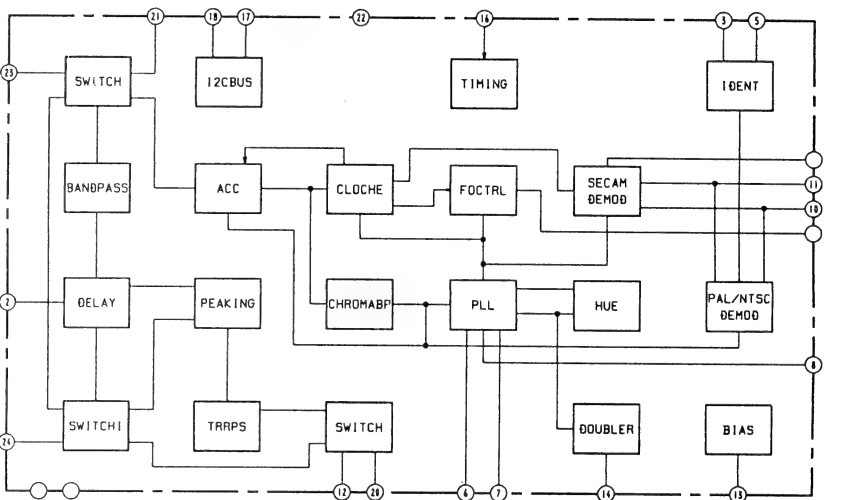
A BOARD IC201 TDA6622 (UK Model only)



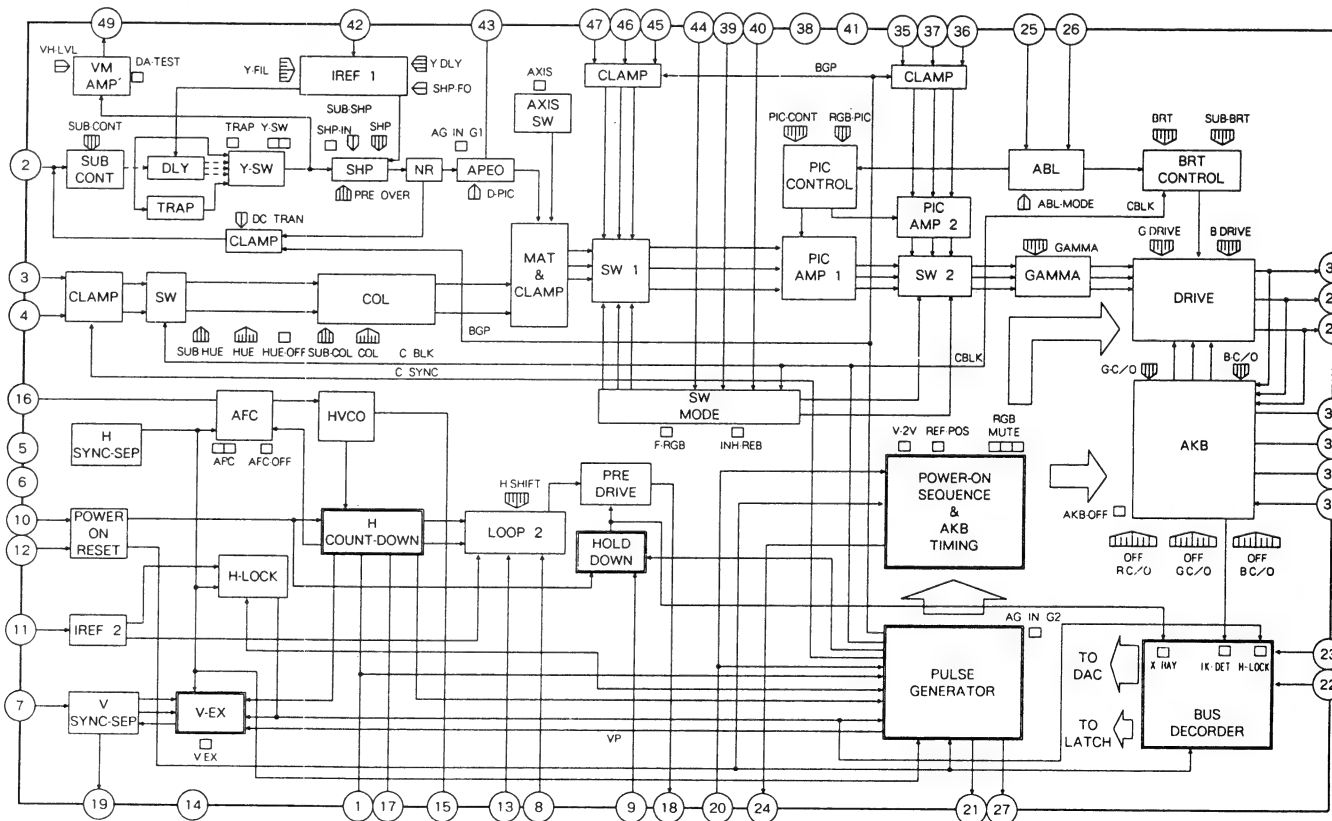
A BOARD IC201 TDA6612



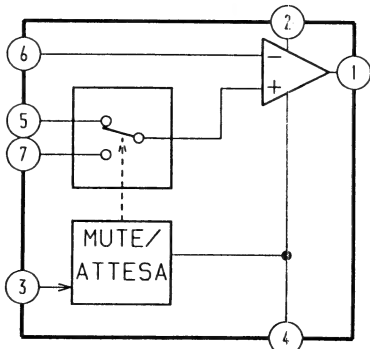
A BOARD IC301 TDA9145



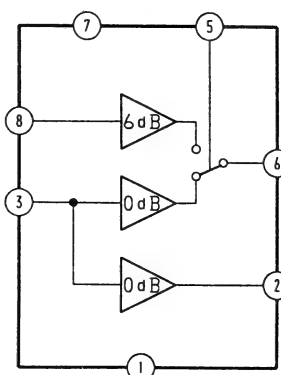
A BOARD IC304 CXA1587S



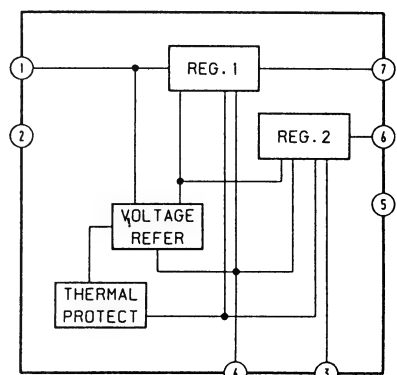
A BOARD IC251/261 TDA2052



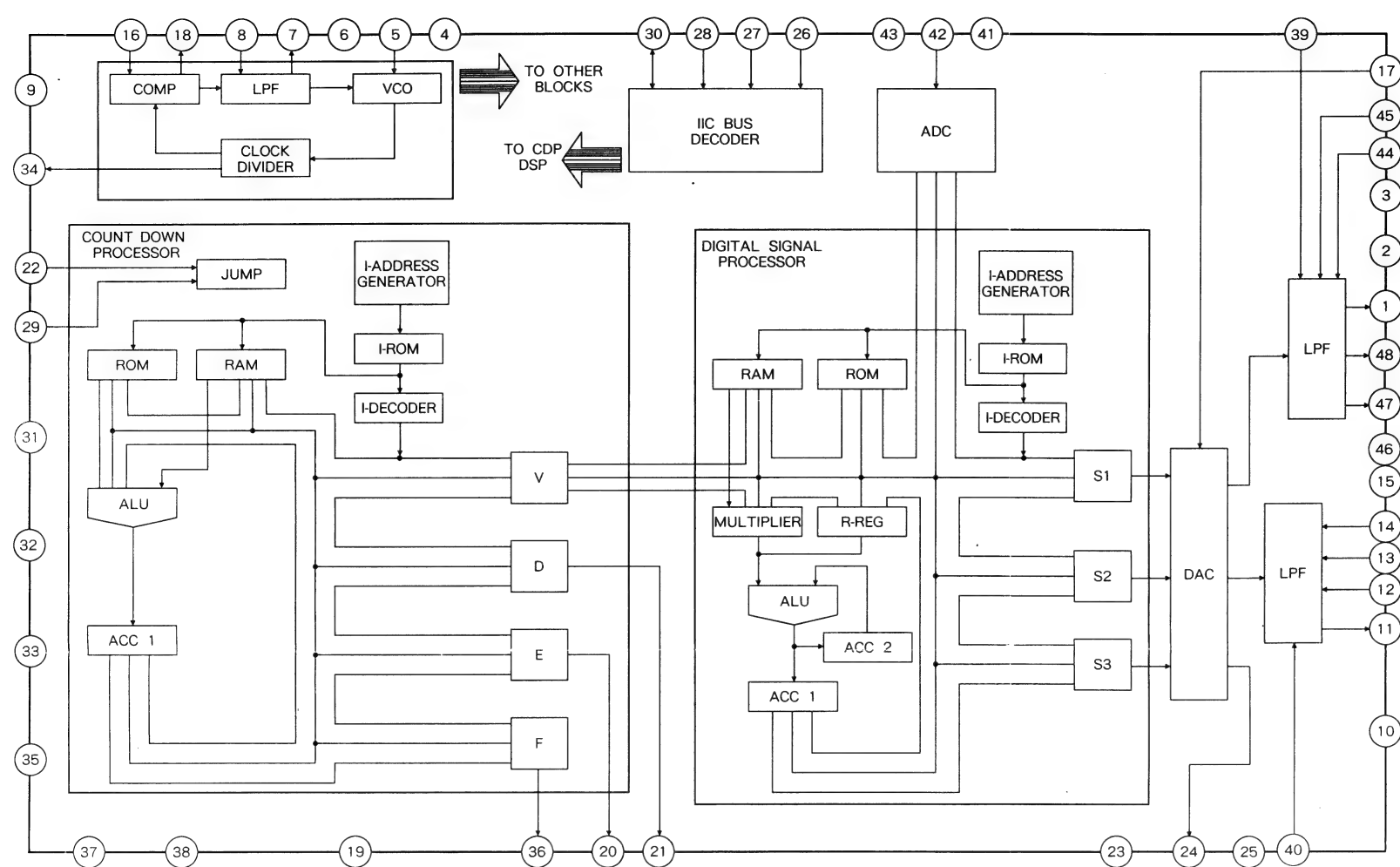
A BOARD IC402 TEA2114



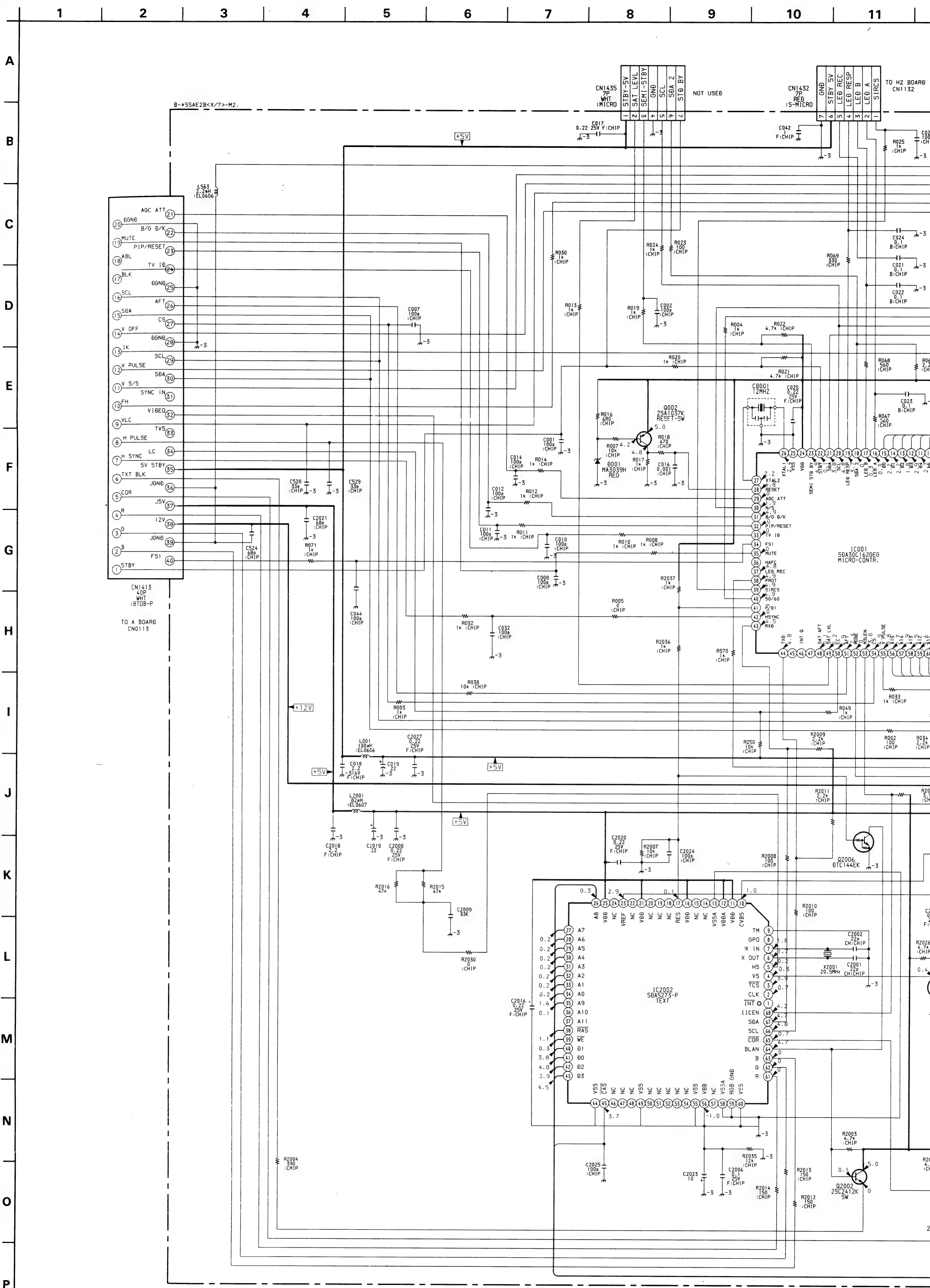
A BOARD IC681 TDA8134A

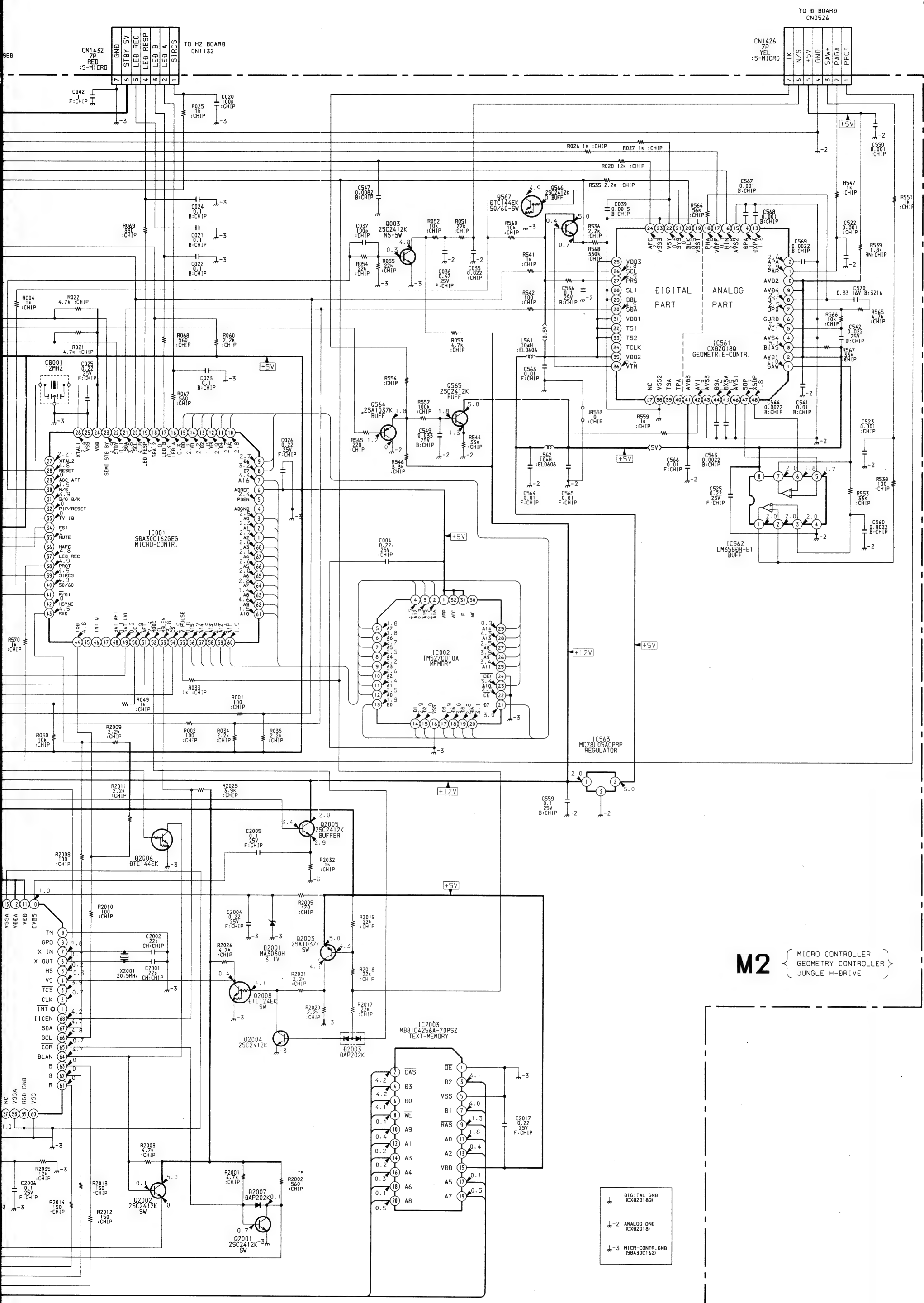


• M2 BOARD IC561 CXD2018Q



A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P





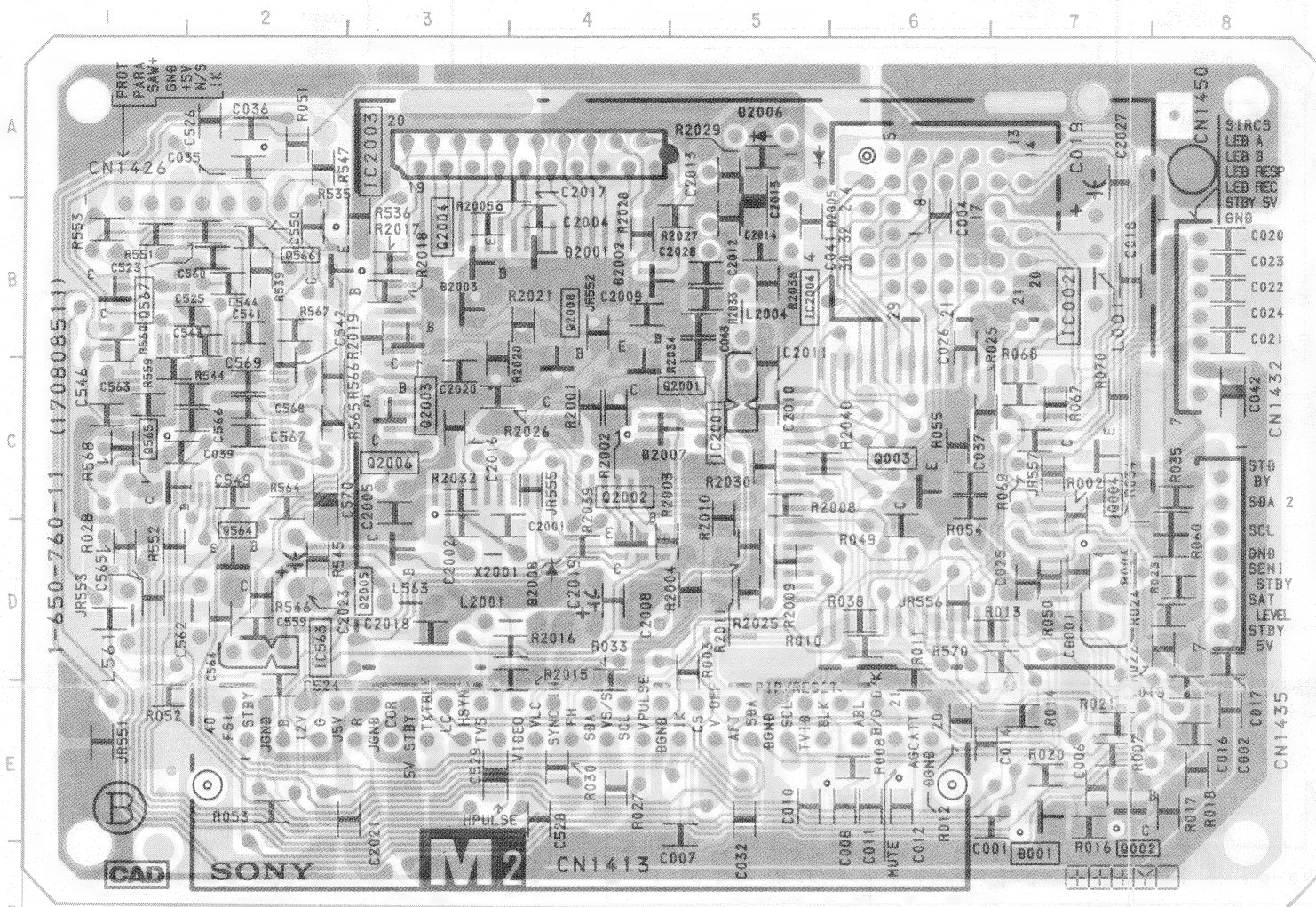
M2

MICRO CONTROLLER,
GEOMETRY CONTROLLER,
JUNGLE, H - DRIVE

D

H/V OUT, PIN OUT,
POWER SUPPLY

- M2 BOARD -



IC

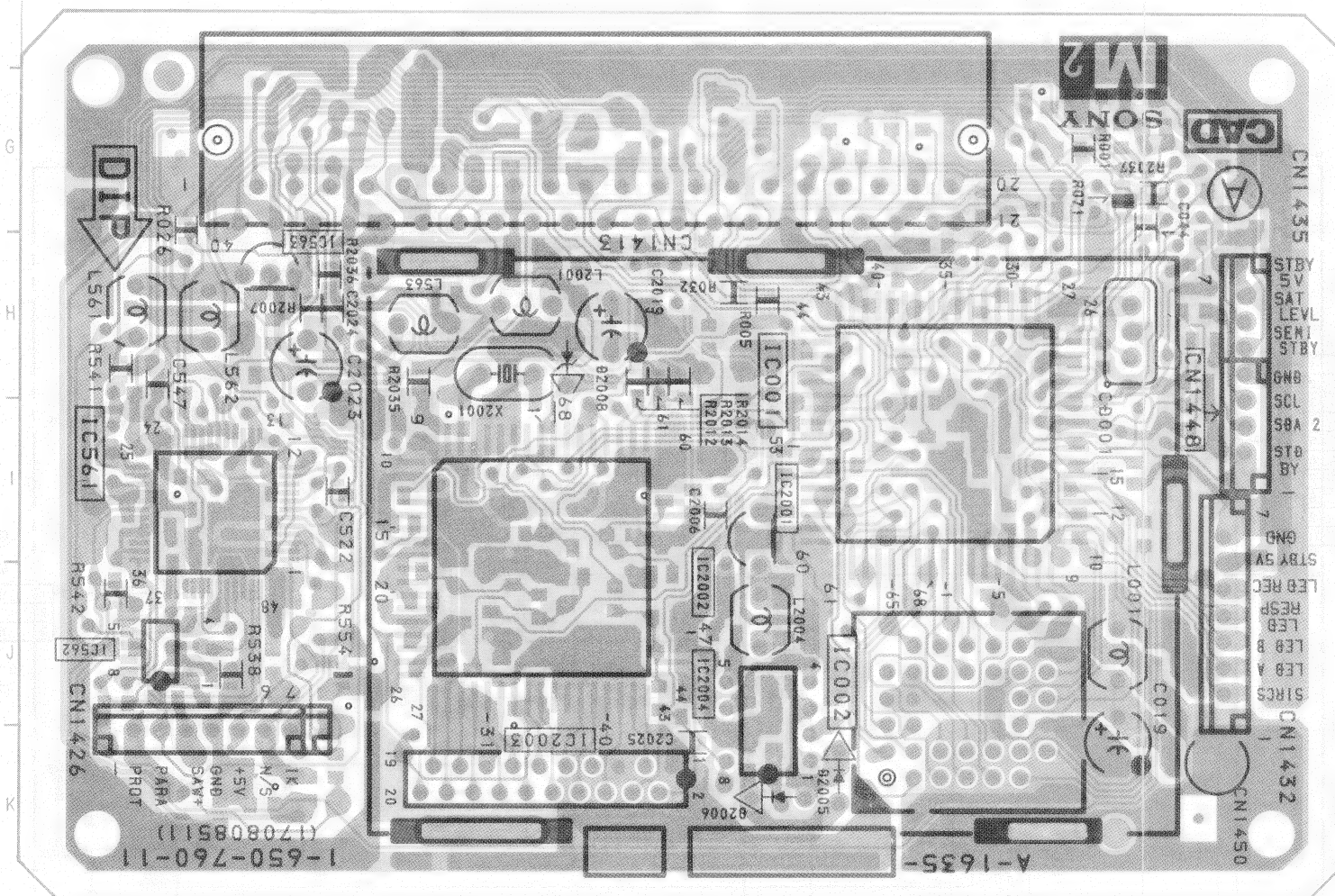
IC001	C - 3
IC002	B - 3, J - 3
IC561	C - 8
IC562	B - 8
IC563	D - 7, H - 7
IC2001	C - 4, I - 4
IC2002	C - 6
IC2003	B - 5, J - 6
IC2004	A - 4, J - 4

TRANSISTOR

Q002	G - 2
Q003	I - 3
Q564	H - 7
Q565	I - 8
Q566	J - 7
Q567	J - 8
Q2001	I - 5
Q2002	J - 5
Q2003	I - 6
Q2005	H - 5
Q2006	K - 5
Q2008	I - 6

DIODE

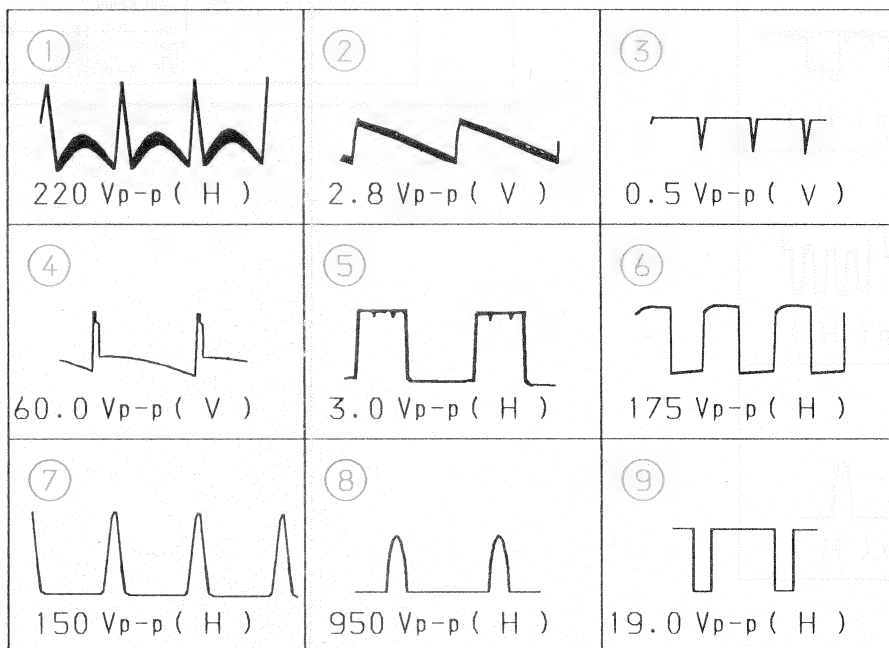
D001	G - 2
D2001	I - 5
D2002	J - 5
D2003	I - 6



Note:

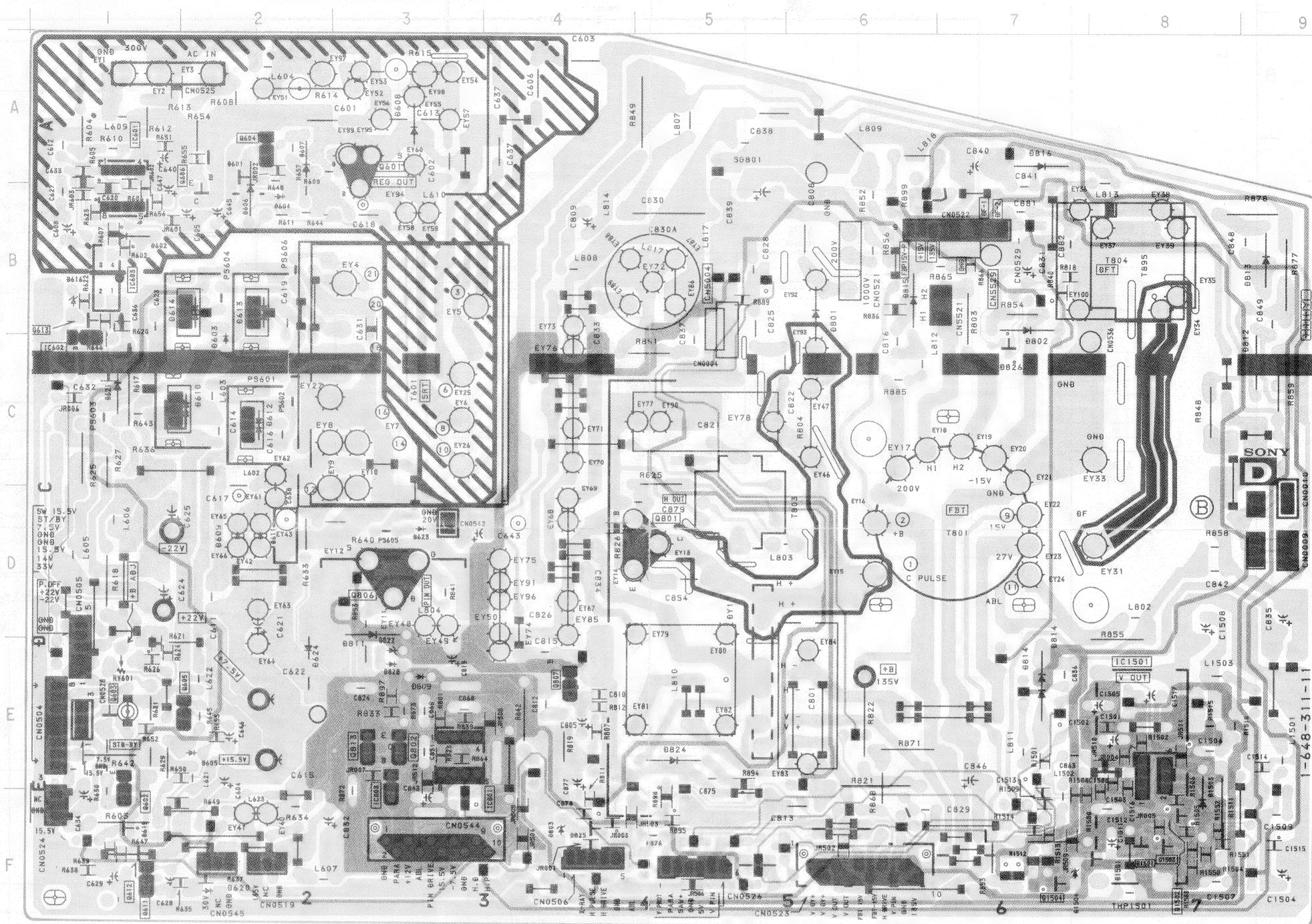
- Pattern from the side which enables seeing.
- Pattern of the rear side.

• WAVEFORMS D BOARD



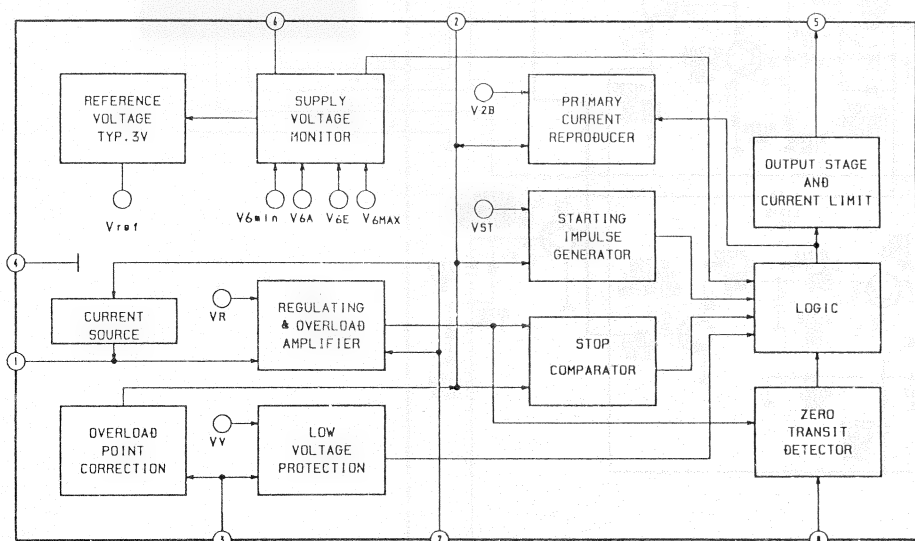
- D BOARD -

Note :
• : Pattern from the side which enables seeing.
• : Pattern of the rear side.



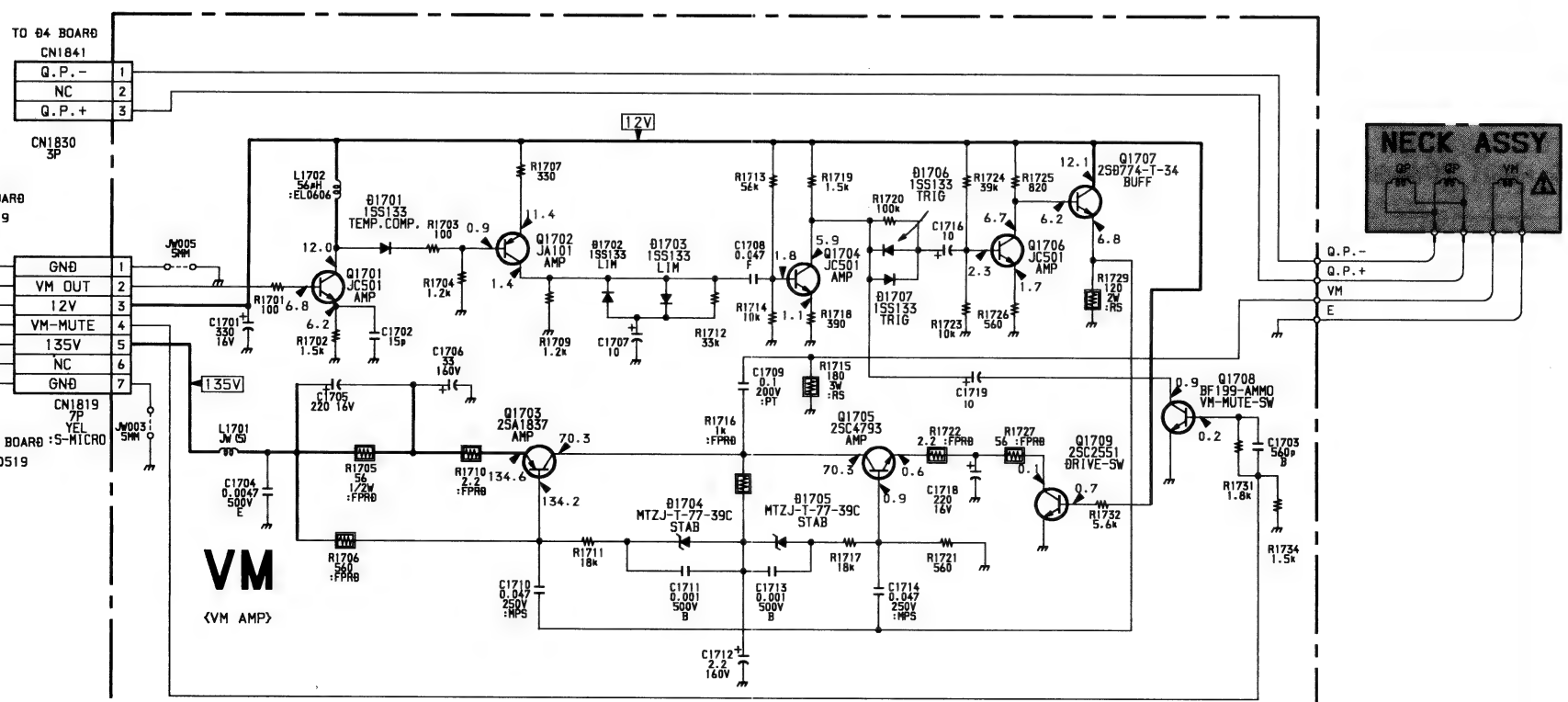
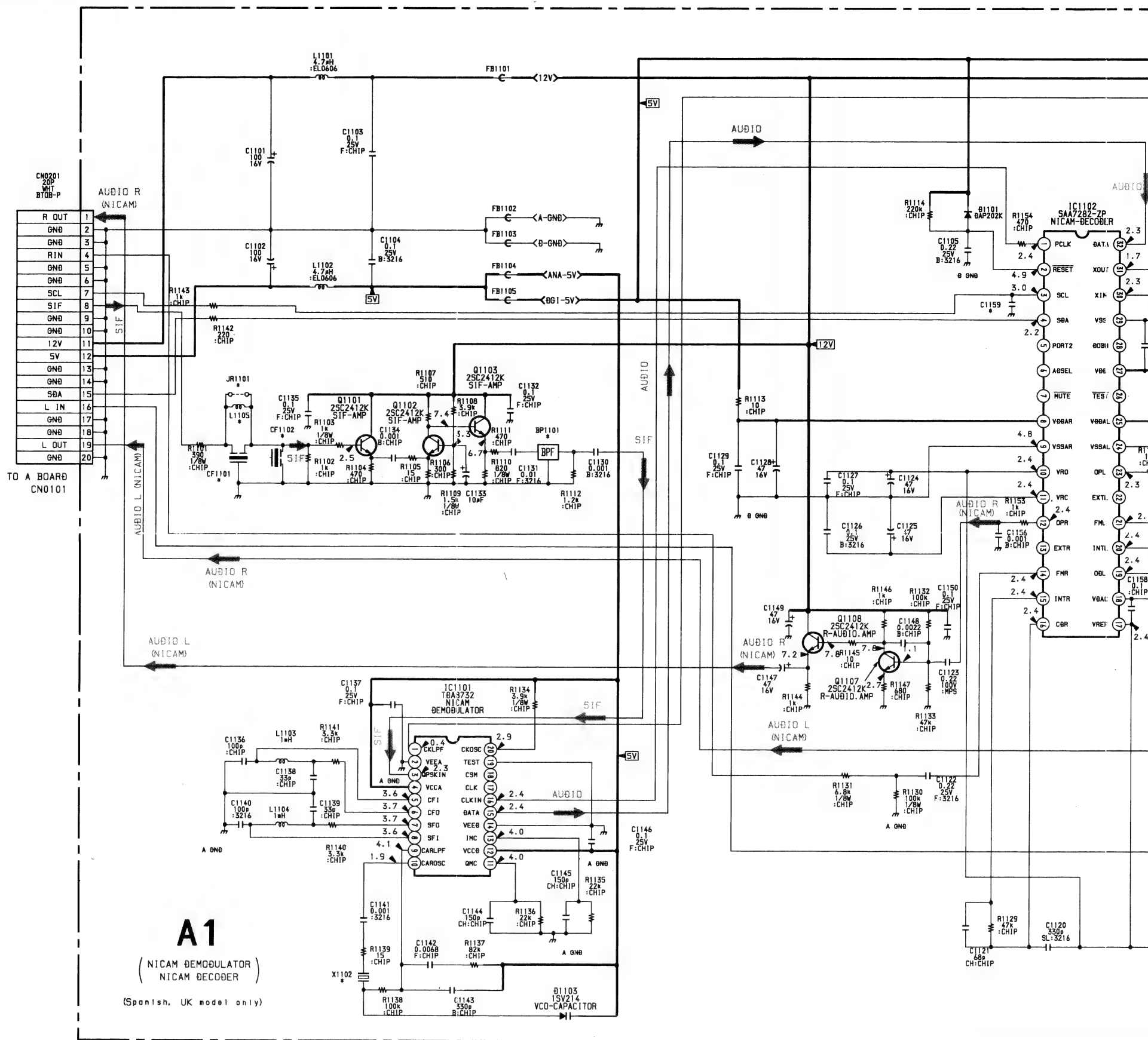
NOTE:
The circuit indicated as left contains high voltage of over 600 Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.

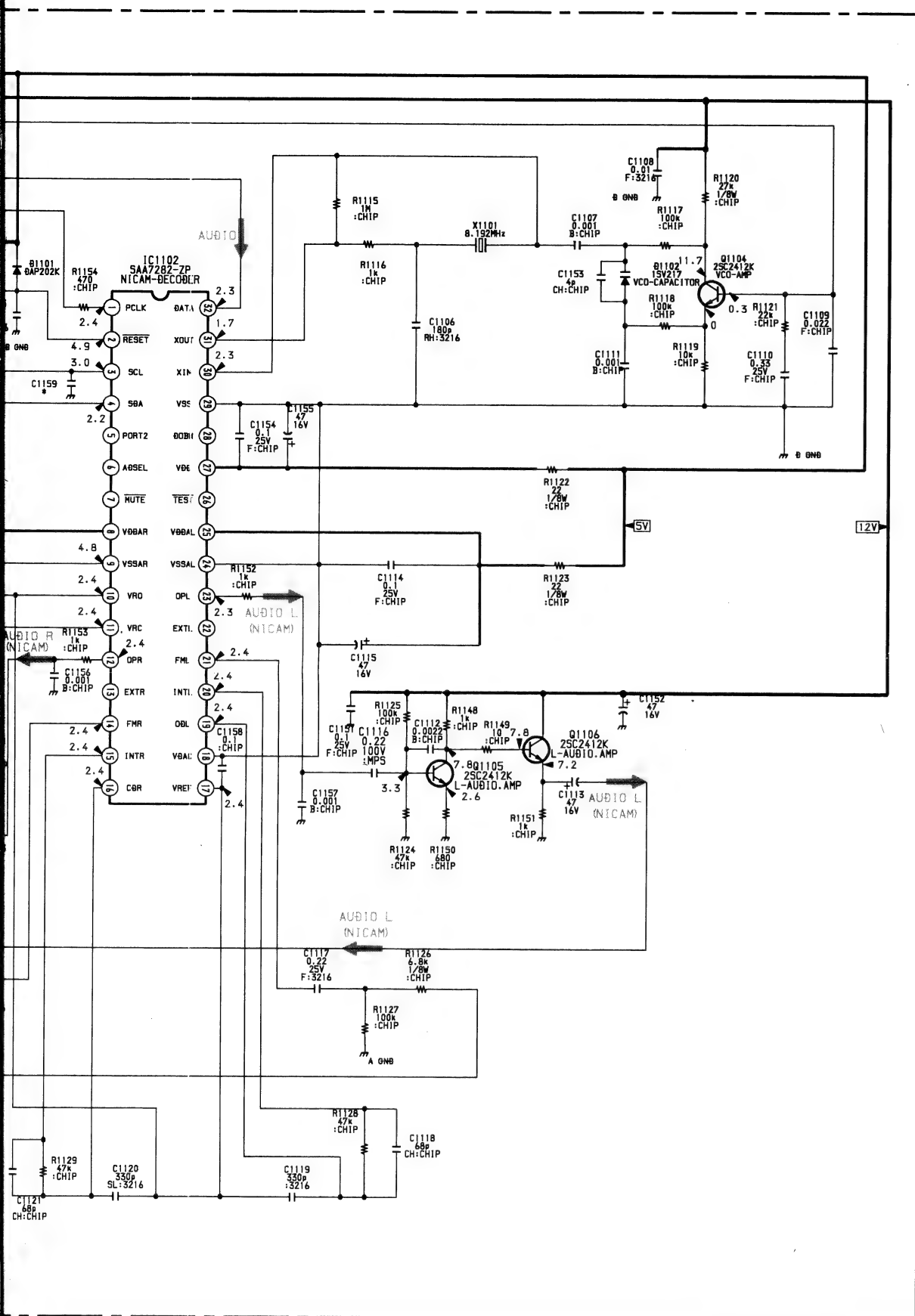
• D BOARD IC601 TDA4605-3



IC		D607	A - 2
IC601	A - 1	D608	A - 3
IC602	C - 1	D610	C - 2
IC603	B - 1	D611	D - 2
IC801	E - 3	D612	C - 2
IC803	F - 3	D613	B - 2
IC1501	E - 8	D614	B - 2
TRANSISTOR		D616	B - 1
Q601	A - 3	D619	F - 1
Q602	F - 1	D620	F - 2
Q603	E - 1	D621	C - 1
Q604	A - 2	D624	E - 2
Q605	E - 2	D801	B - 6
Q606	B - 2	D802	B - 7
Q611	F - 1	D803	F - 4
Q612	F - 1	D809	E - 3
Q613	B - 1	D811	D - 3
Q801	D - 5	D812	C - 9
Q802	E - 3	D813	B - 9
Q806	D - 3	D814	E - 7
Q807	E - 4	D815	B - 6
Q813	E - 3	D816	A - 7
Q1501	F - 8	D822	E - 3
Q1502	F - 8	D824	E - 5
Q1503	F - 8	D825	F - 4
Q1504	F - 7	D826	C - 7
DIODE		D828	E - 3
D601	A - 2	D1501	F - 8
D602	B - 1	D1503	F - 8
D604	B - 2	D1504	F - 7
D605	E - 2	VARIABLE RESISTOR	
D606	B - 2		
		RV601	E - 1

(Spanish, UK Model only)



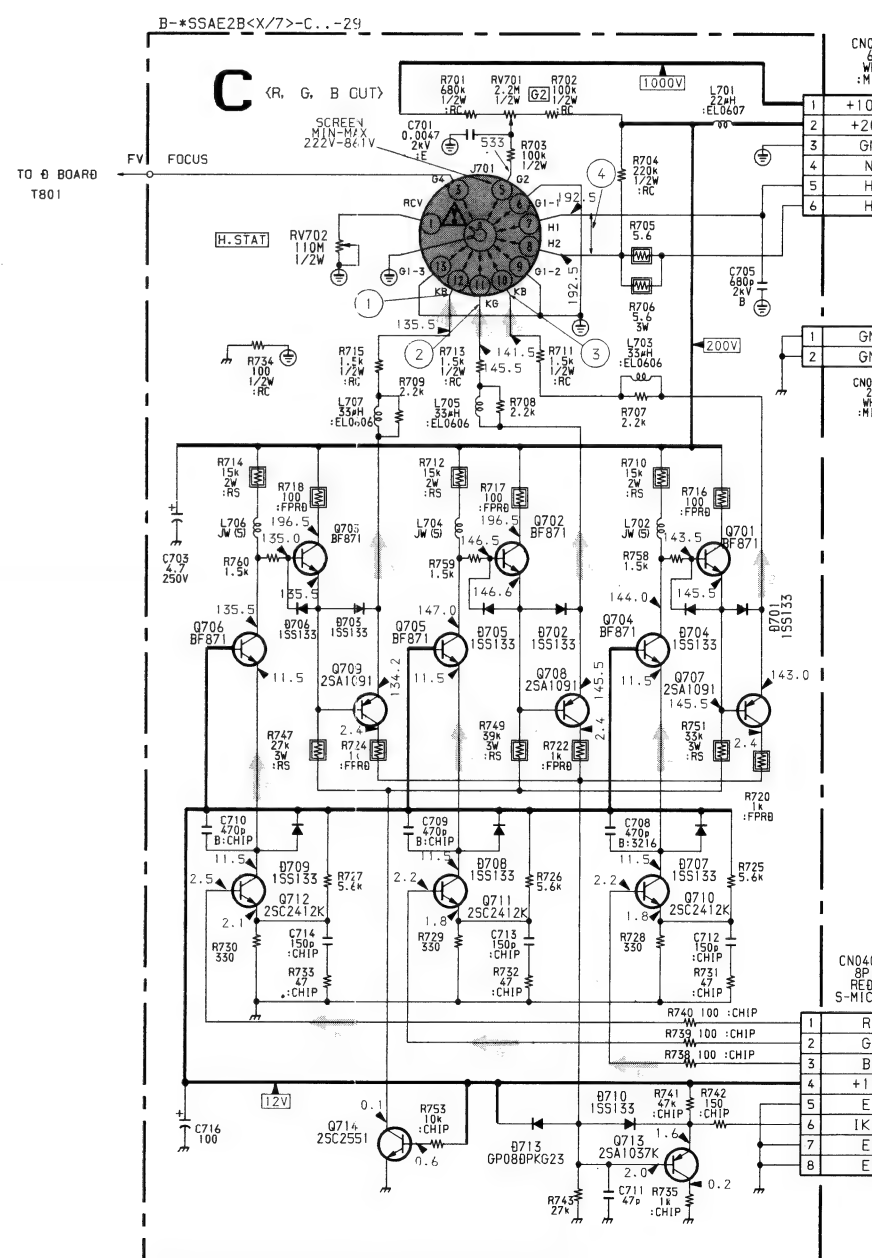
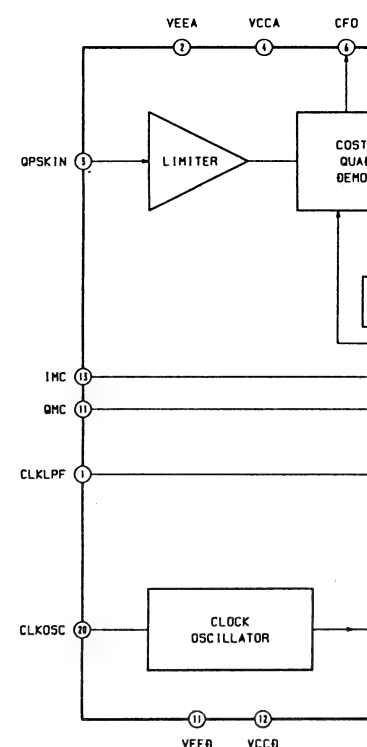


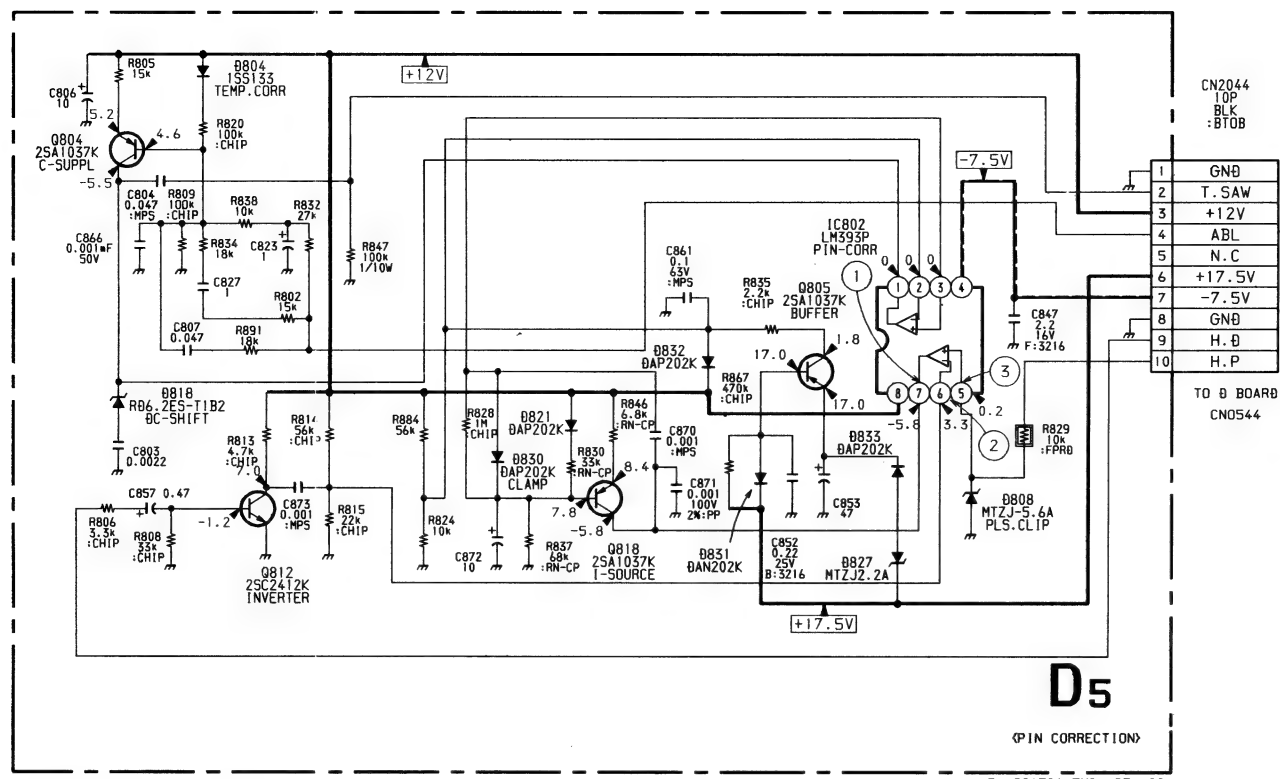
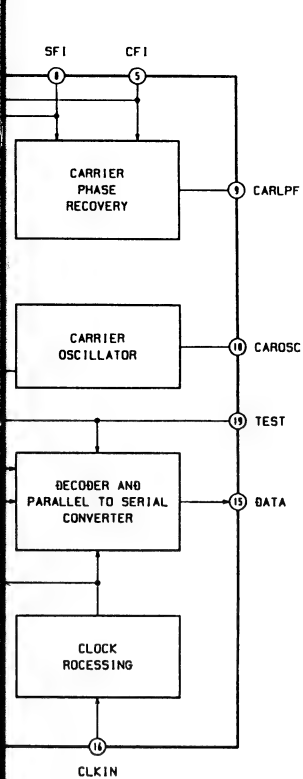
B-SS4536<AEP>-A1.

A1 BOARD * MARK

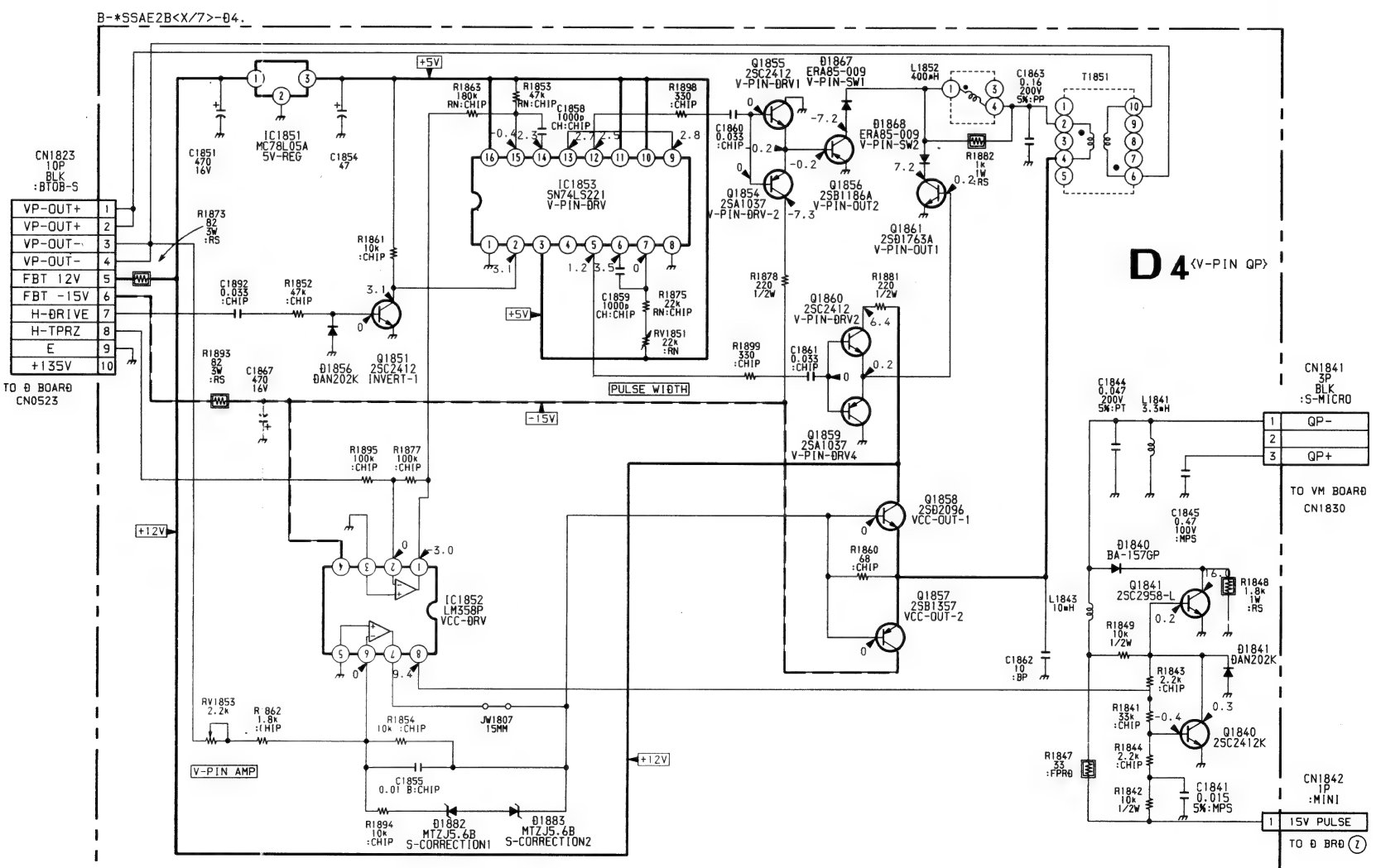
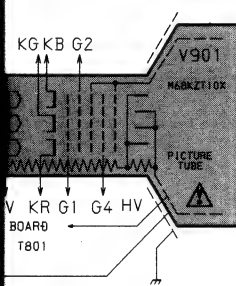
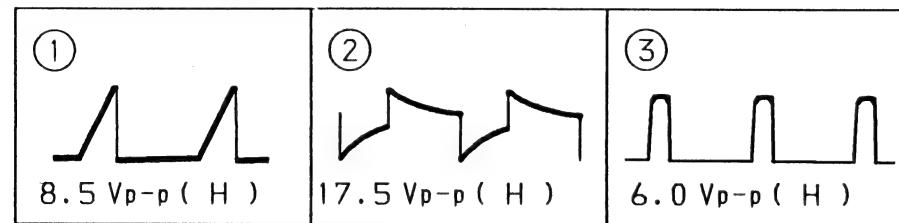
Model	KV-X2973E	KV-X2972U
BP1101	5.850MHz	6.552MHz
C1159	-	47P
CF1101	-	6.0MHz
CF1102	5.5MHz	-
JR1101	0 : CHIP	-
L1105	-	15MM/h
X1102	11.700MHz	13.104MHz

- A1 BOARD IC1101 TD

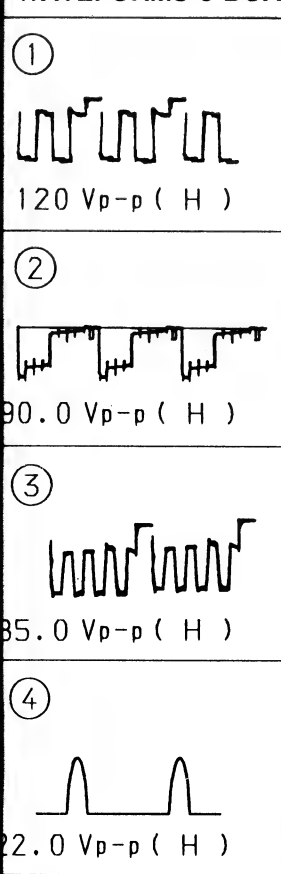




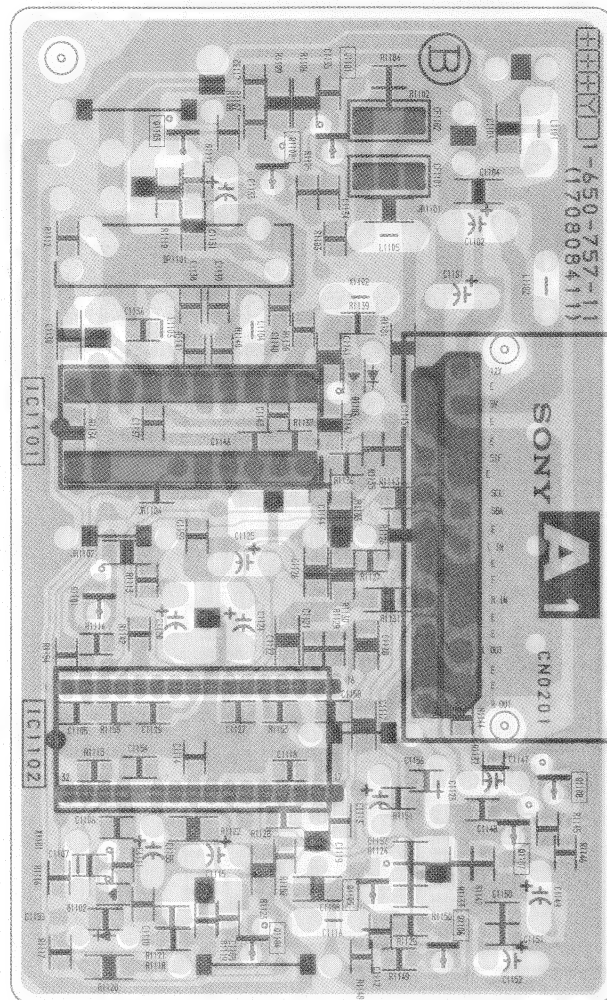
• WAVEFORMS D5 BOARD



WAVEFORMS C BOARD



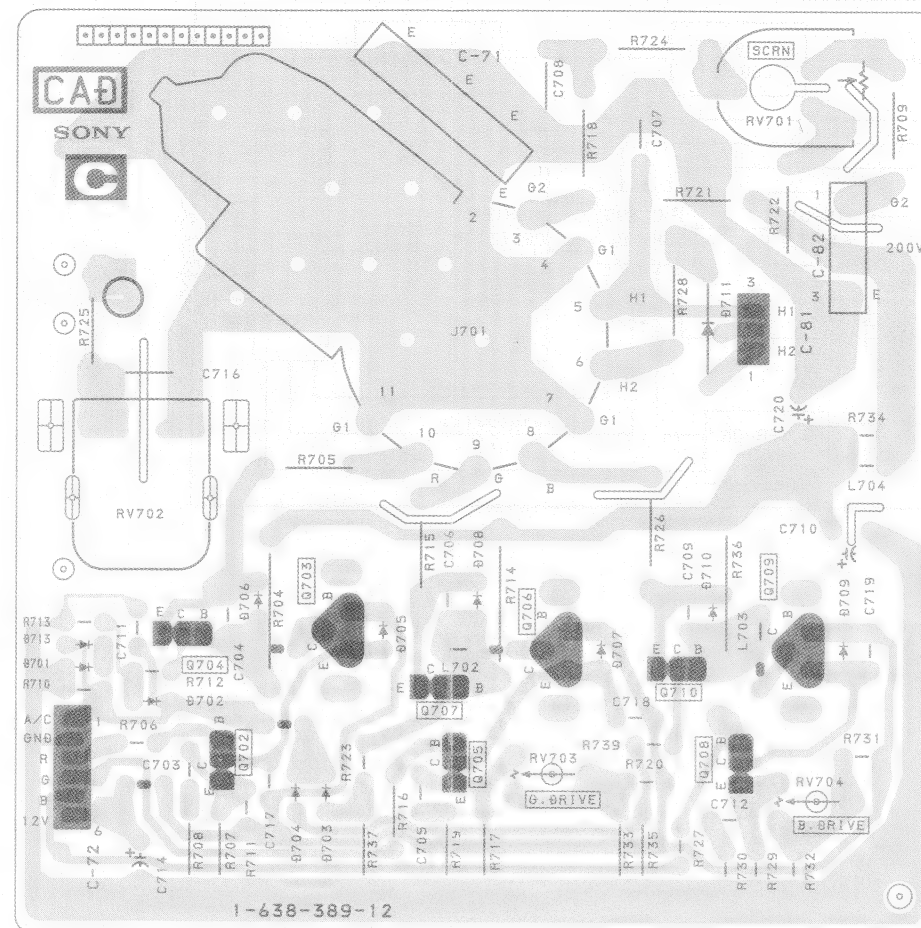
— A1 BOARD — (Spanish, UK Model only)



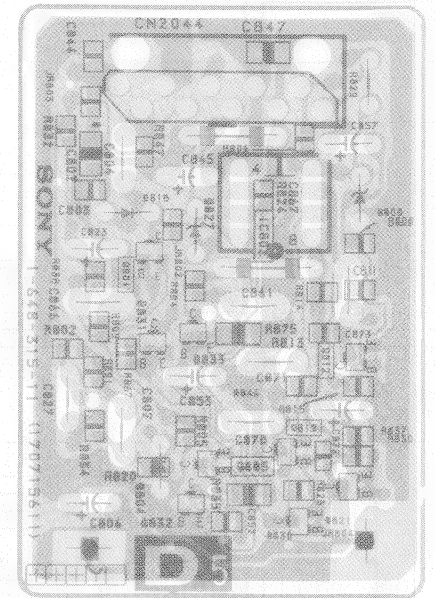
Note :

- : Pattern from the side which enables seeing.
- : Pattern of the rear side.

— C BOARD —



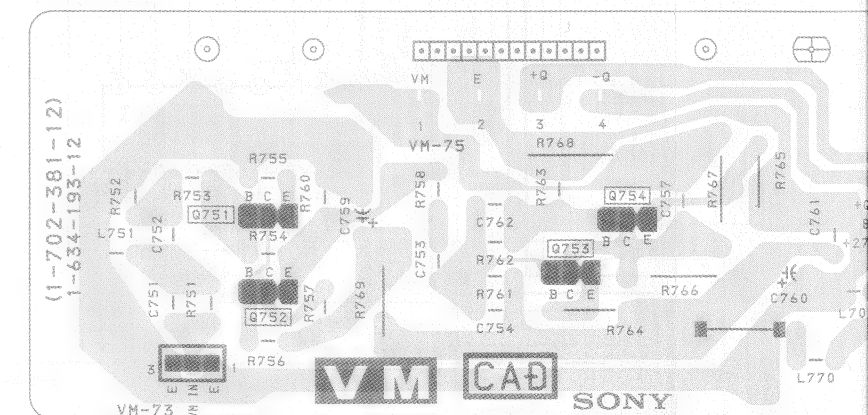
— D5 BOARD —



Note :

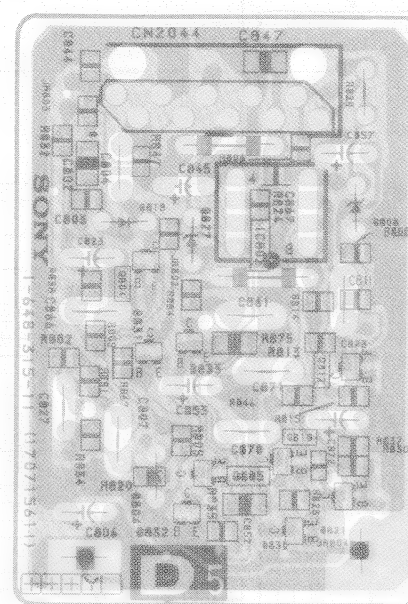
- : Pattern from the side which enables seeing.
- : Pattern of the rear side.

— VM BOARD —





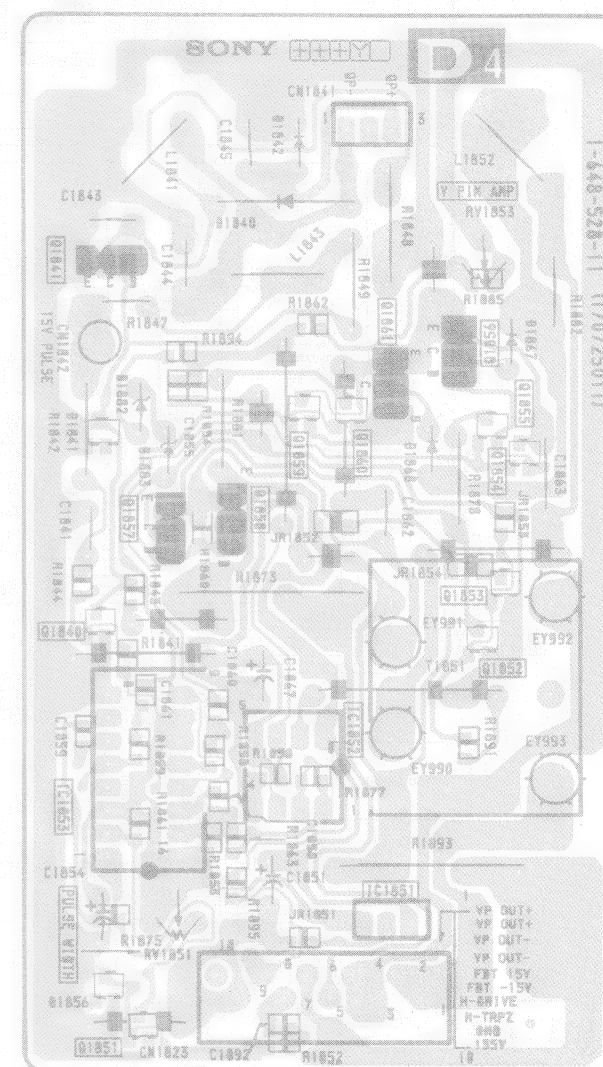
— D5 BOARD —



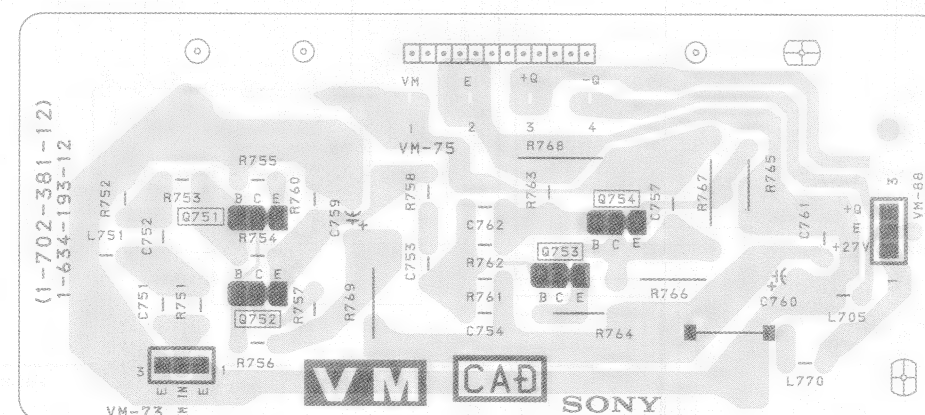
Note :

- **Side pattern** : Pattern from the side which enables seeing.
- **Rear pattern** : Pattern of the rear side.

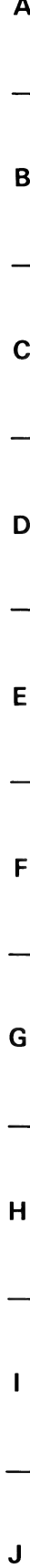
— D4 BOARD —



— VM BOARD —



A
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B
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C
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D
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E
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F
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G
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H
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I
—
J



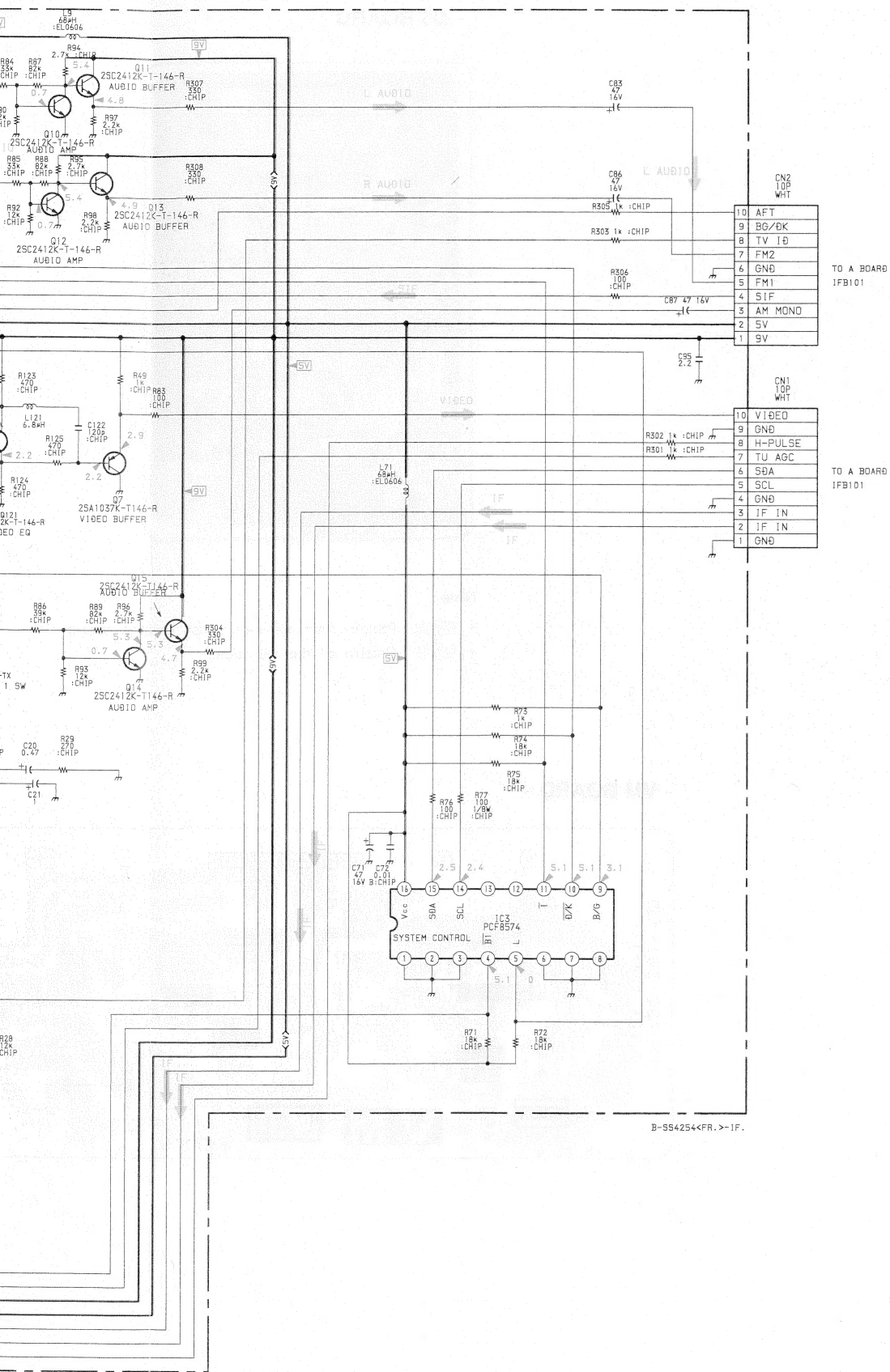
The block diagram illustrates the internal architecture of the 6801 microcontroller and its connections to external components. The internal components include:

- INTERRUPT LOGIC**: Connected to pins 13, 1, 2, and 5.
- LP FILTER**: Connected to pins 13 and 14.
- INPUT FILTER**: Connected to pins 14 and 15.
- I²C BUS CONTROL**: The central interface unit, connected to pins 1, 2, 5, 14, 15, 16, and 8.
- SHIFT REGISTER**: Connected to the I²C BUS CONTROL and the I/O PORTS.
- I/O PORTS**: The output interface, connected to the SHIFT REGISTER and the I²C BUS CONTROL.

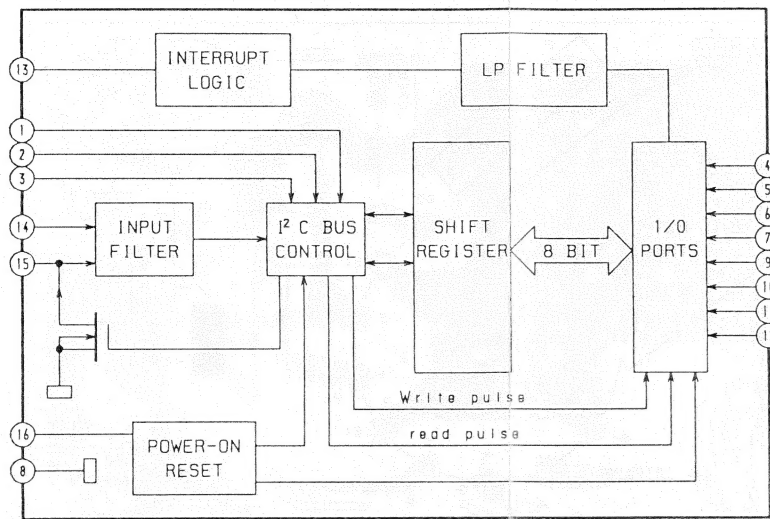
External components and their connections are as follows:

- Pin 13**: Connected to the INTERRUPT LOGIC and the LP FILTER.
- Pin 1**: Connected to the INTERRUPT LOGIC and the I²C BUS CONTROL.
- Pin 2**: Connected to the INTERRUPT LOGIC and the I²C BUS CONTROL.
- Pin 5**: Connected to the INTERRUPT LOGIC and the I²C BUS CONTROL.
- Pin 14**: Connected to the LP FILTER and the INPUT FILTER.
- Pin 15**: Connected to the INPUT FILTER and the I²C BUS CONTROL.
- Pin 16**: Connected to the POWER-ON RESET and the I²C BUS CONTROL.
- Pin 8**: Connected to the POWER-ON RESET and the I²C BUS CONTROL.

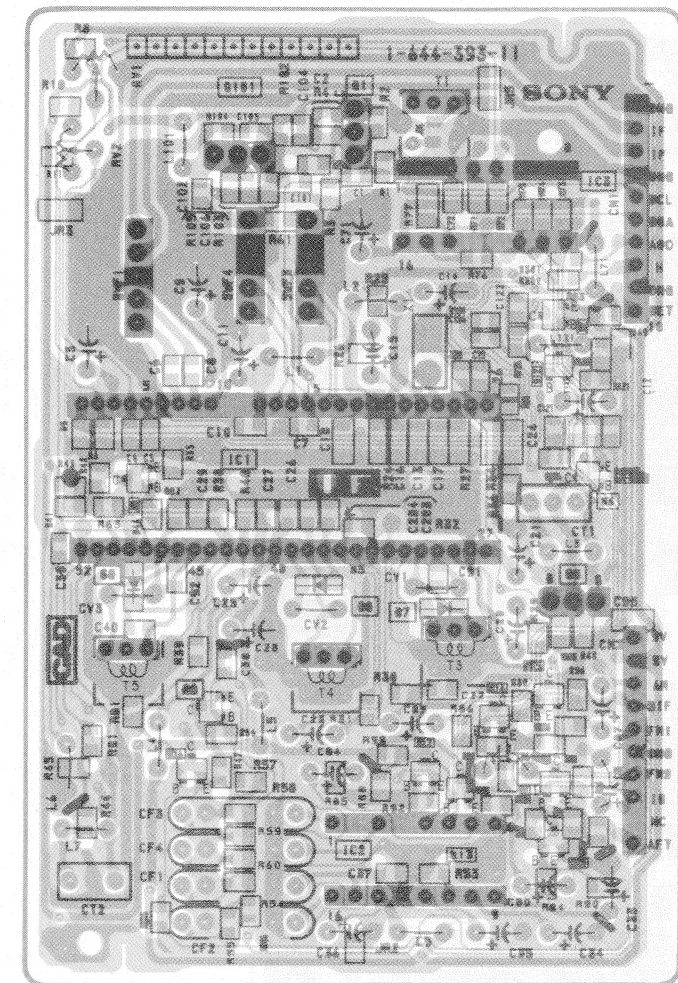
The I²C BUS CONTROL is connected to the SHIFT REGISTER and the I/O PORTS. The SHIFT REGISTER is connected to the I/O PORTS via an 8-bit data bus. The I/O PORTS are connected to the I²C BUS CONTROL via a write pulse and a read pulse.



• IF BOARD IC3 PC8574 (French Model)



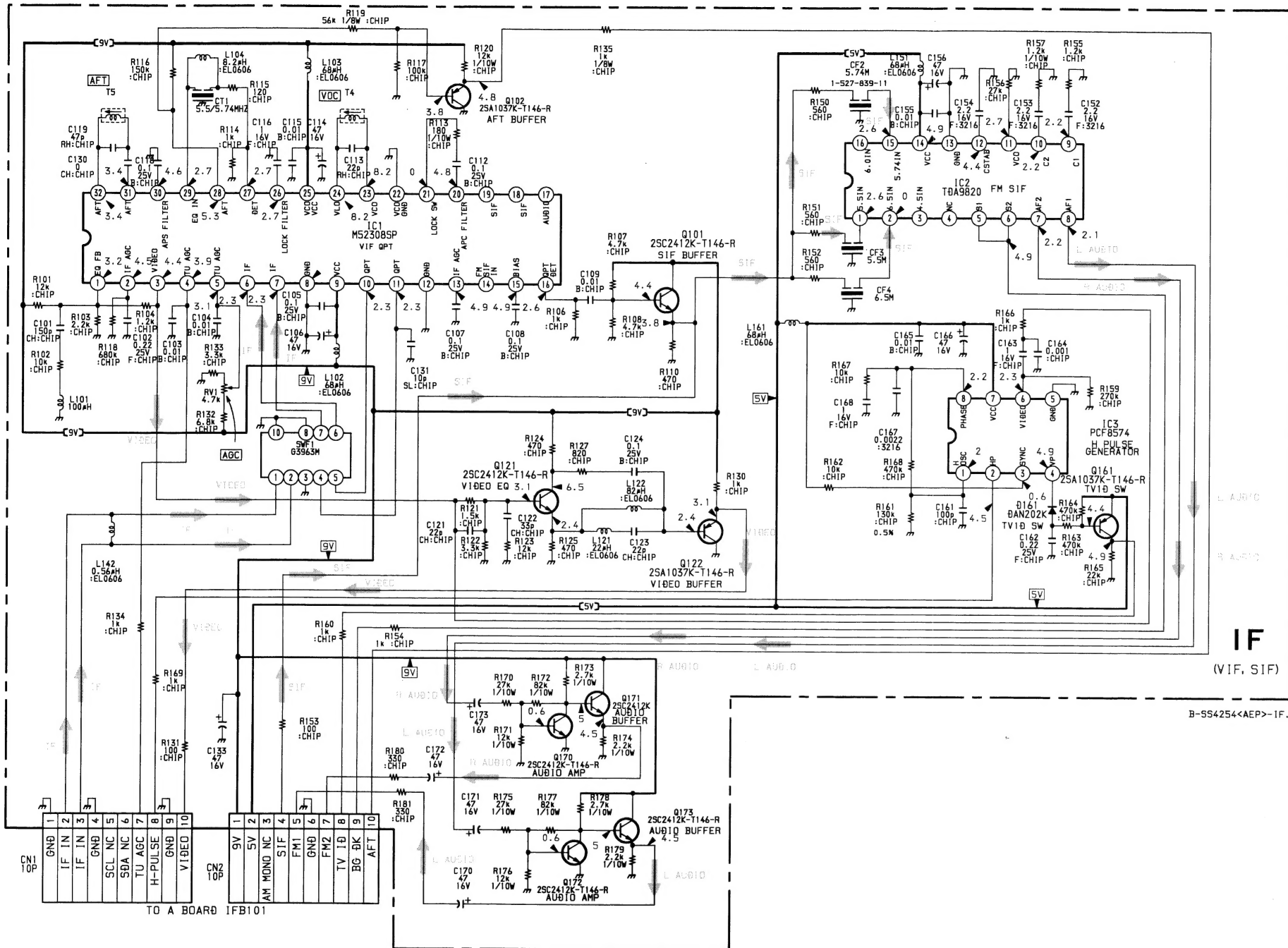
– IF BOARD – (French Model)



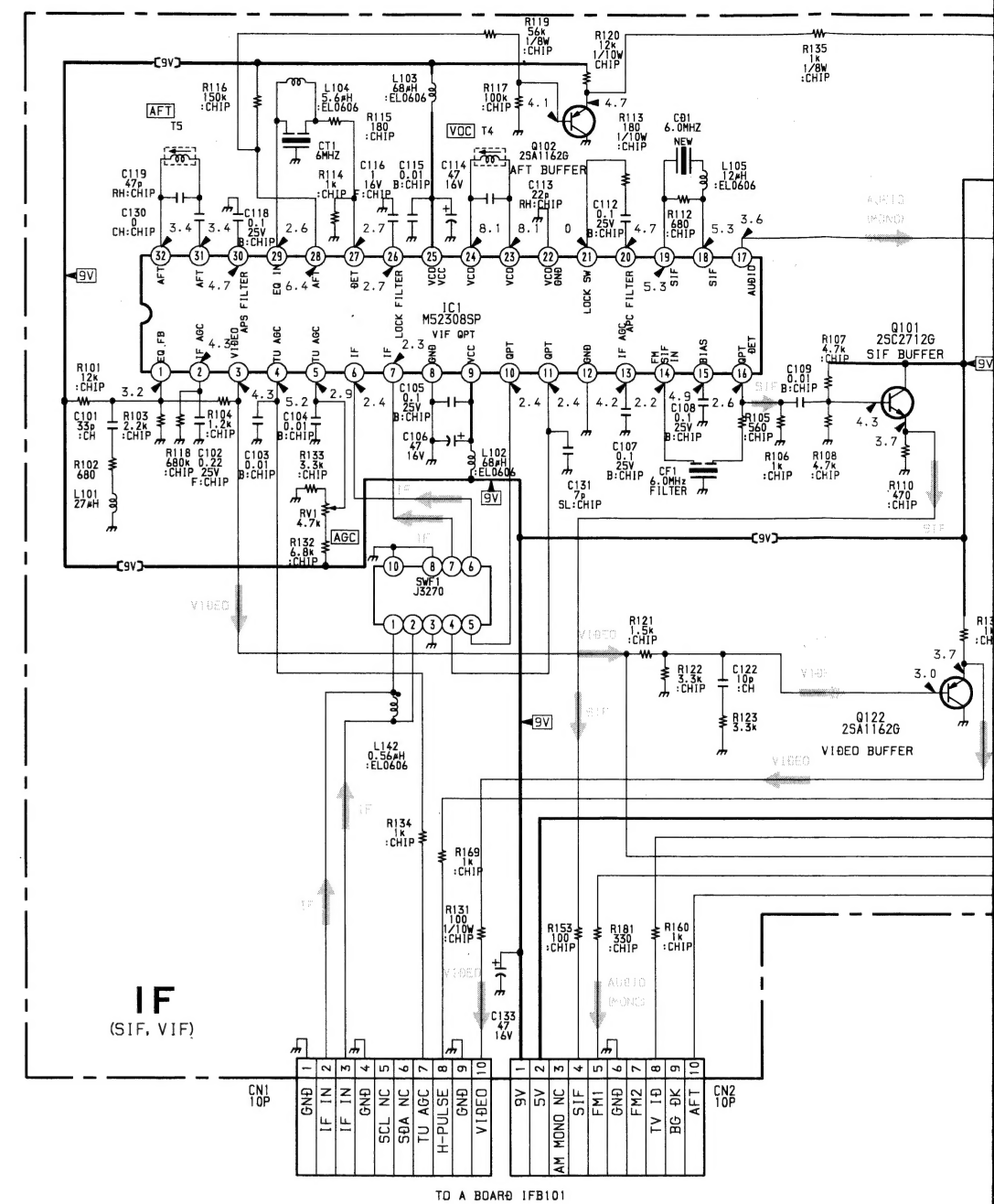
Note :

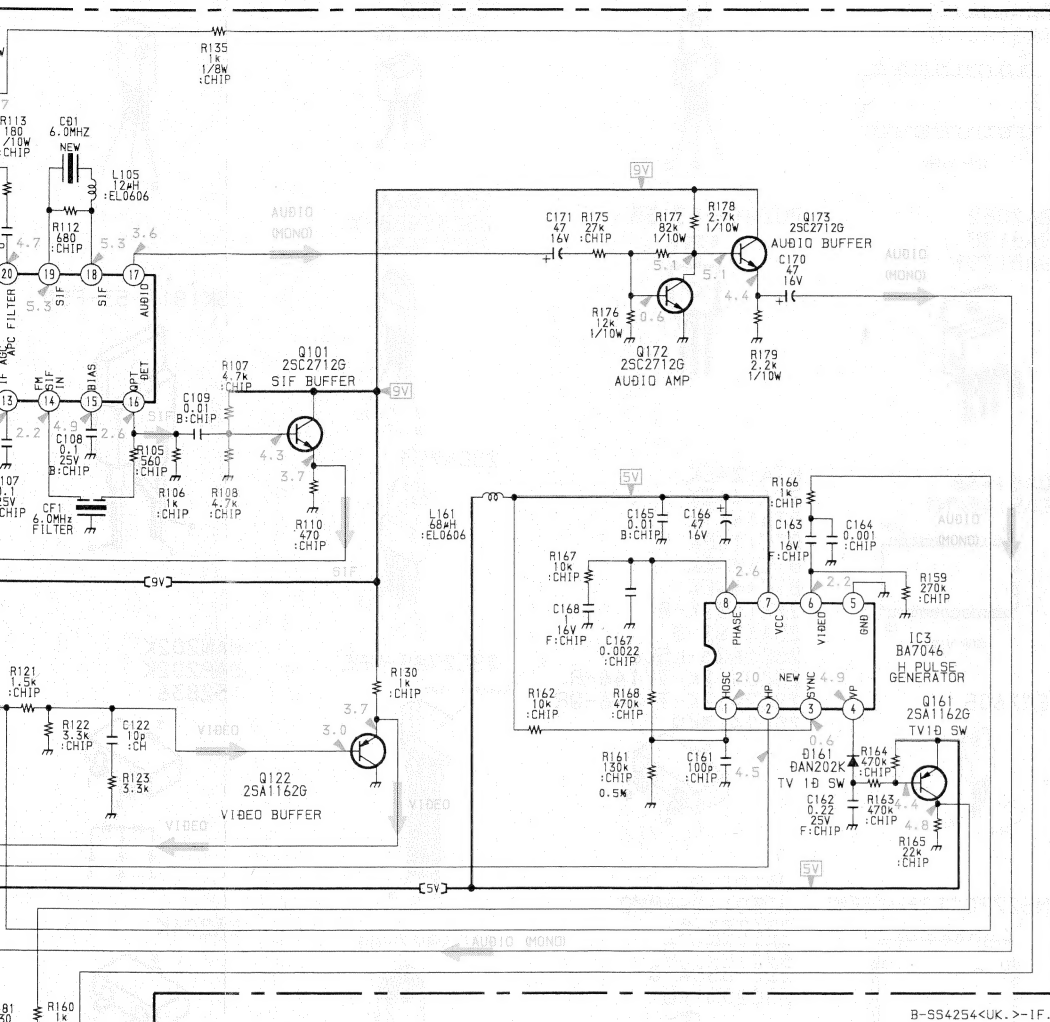
- : Pattern from the side which enables seeing.
- : Pattern of the rear side.

IFH389 (AEP, Italian, Spanish Model)



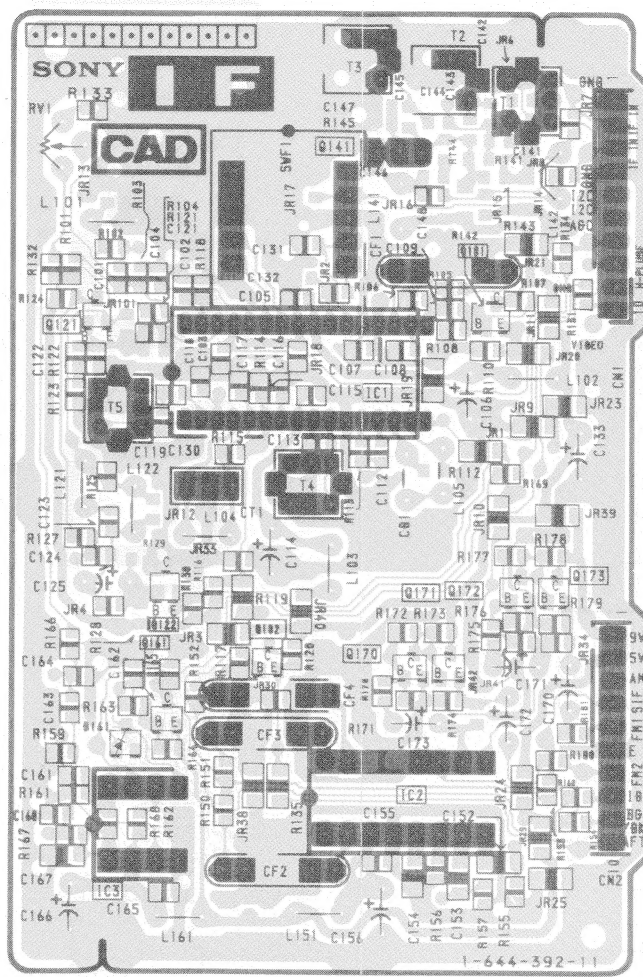
IFH385 (UK Model)



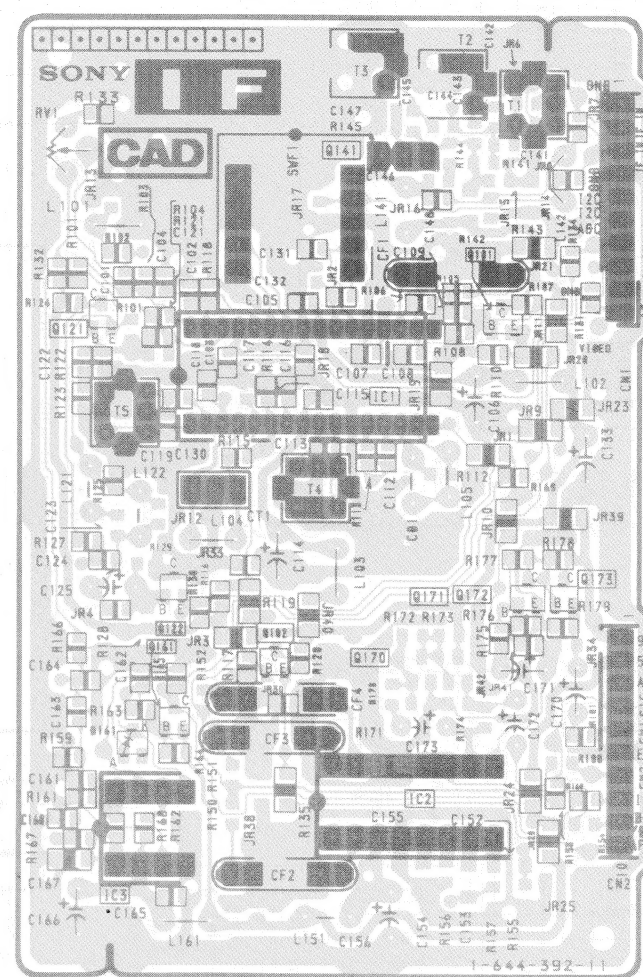


B-554254<UK>-IF.

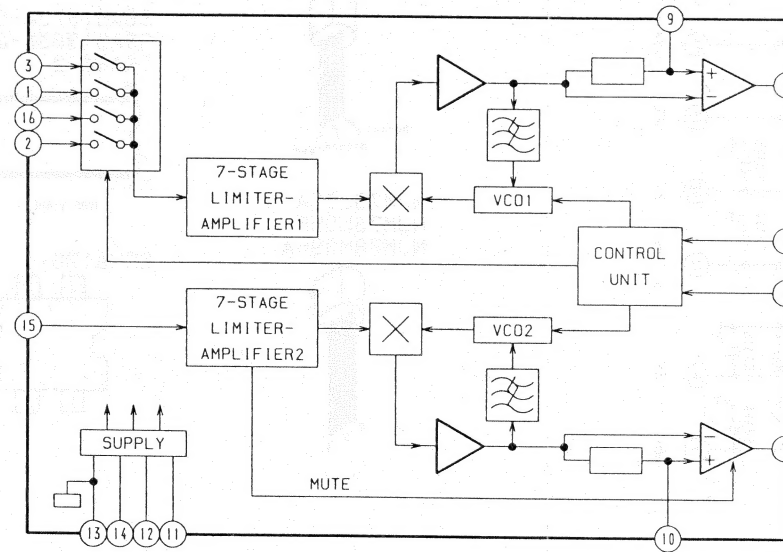
- IF BOARD - (AEP, Italian, Spanish Model)



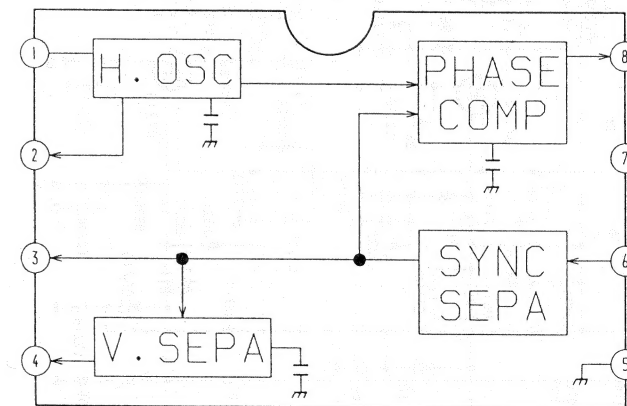
- IF BOARD - (UK Model)



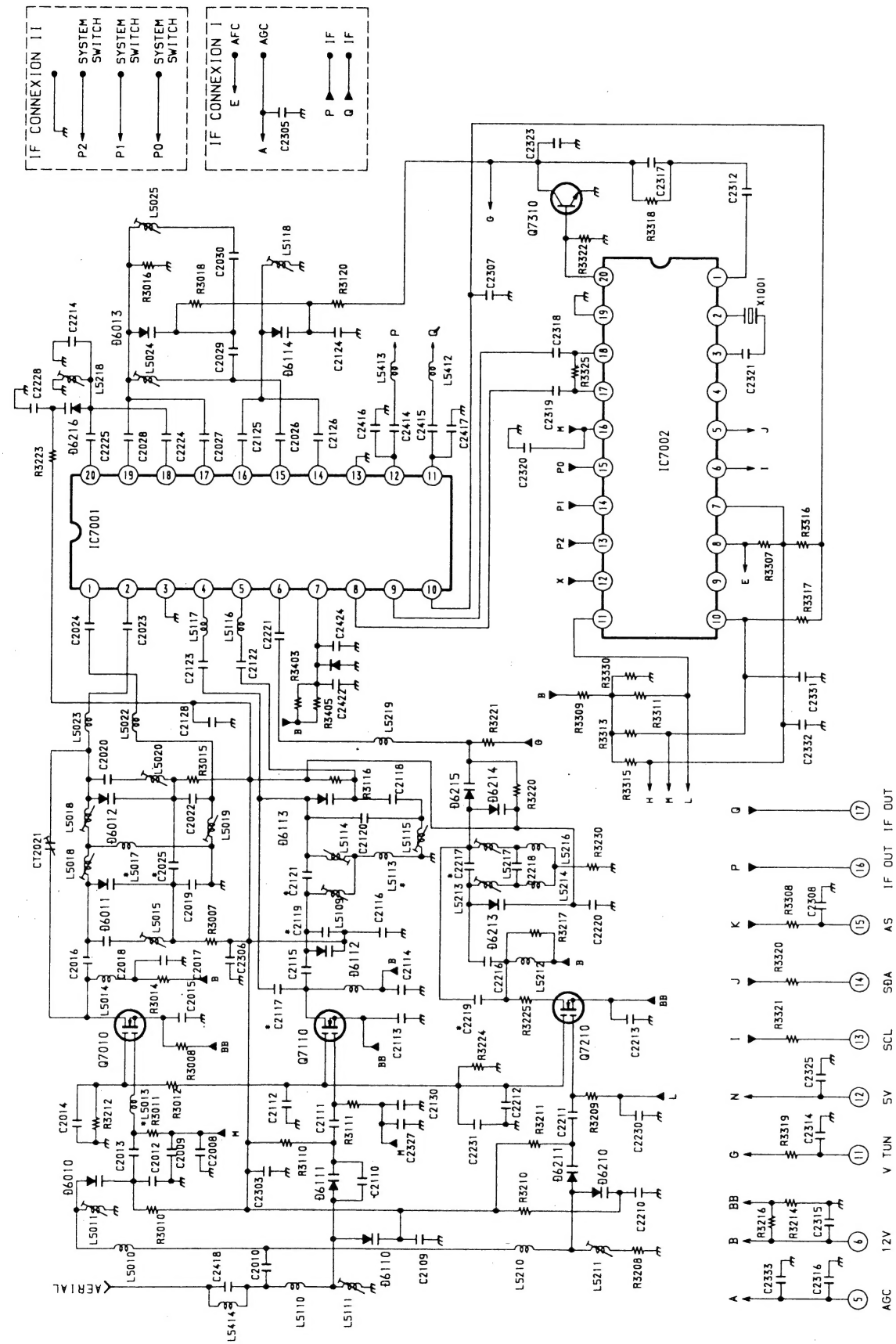
• IF BOARD IC2 TDA9820 (AEP, Italian, Spanish Model)



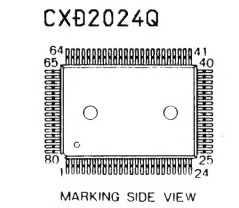
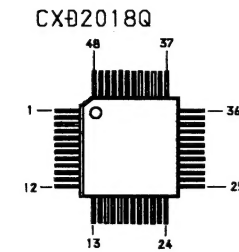
• IF BOARD IC3 BA7046 (AEP, Italian, Spanish Model)



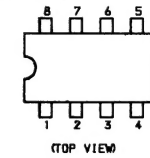
5-4. SCHEMATIC DIAGRAM OF TUNER
A BOARD TU101 UV916H



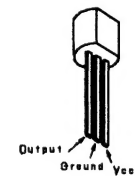
5-5. SEMICONDUCTORS



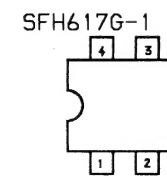
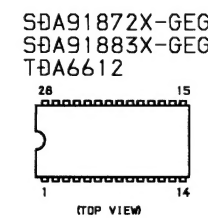
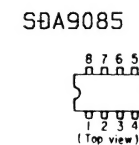
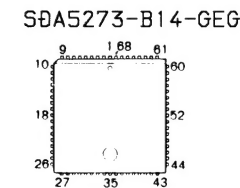
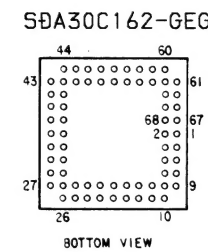
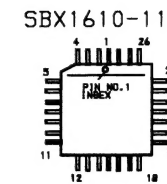
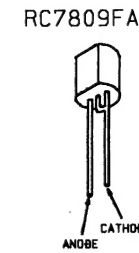
LM358D
LM393P
LM358P
T0A2822M
T0A4605-3
TEA2114
APC358C
APC393C
X24C16P



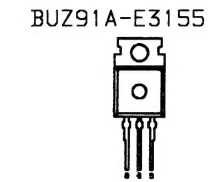
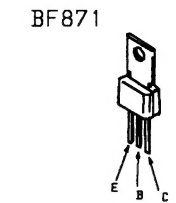
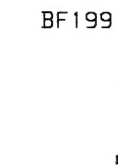
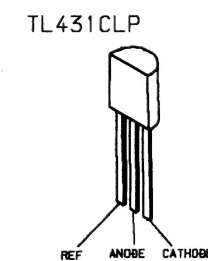
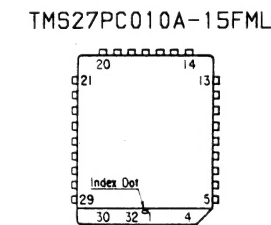
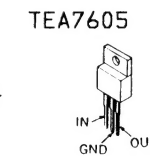
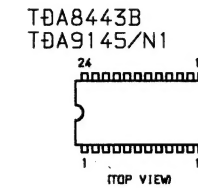
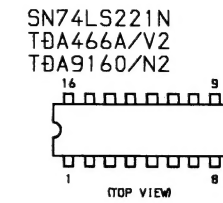
MC78L08ACPRP
MC78L12ACPRP



NJM78L05A
NJM78L05F
NJM78M09FA

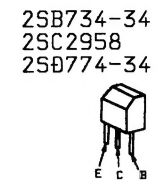
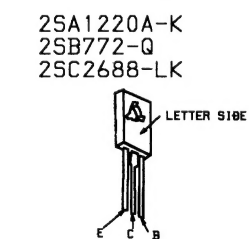


1. VCC
2. NC
3. Vout
4. GND

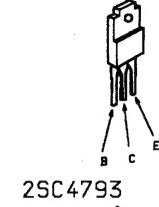


0TA124EK
0TA144EK
0TA144TK
0TC114EK
0TC124EK
0TC144EK
2SA1037K-R
2SA1162-G
2SC1623-L5L6
2SC2412K-T-146-R
2SC2412K-T-146-QR
2SC2413KQ

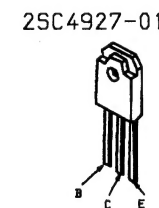
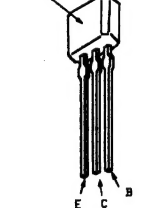
JA101-Q
JC501-Q-AMMO
2SA733-K
2SA1091-0
2SC1890A-0
2SC2551-0



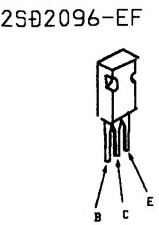
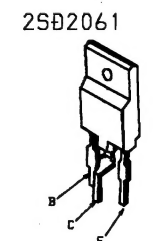
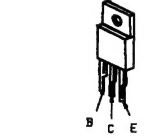
2SB1186A
2SC3298B-Y
2SB1763A



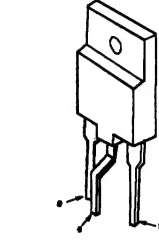
2SC2785-HFE



2SB798A-P
2SB2012



2SK1916-53-F50



0AN202K
0AP202K
1S2836

